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INTERNATIONAL

OCTOBER 1952

VOLUME 27 • NUMBER 10

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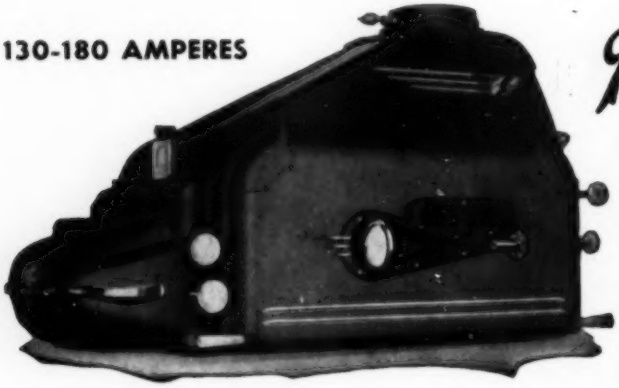

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AARON NADELL, *Editor*

Volume 27 OCTOBER 1952 *Number* 10

Index and Monthly Chat 3

Safety Film: Performance Characteristics 5
ROBERT A. MITCHELL

Cinerama—A Step in the Right Direction 10
AARON NADELL

Theatre Tv Grosses $400,000 Showing Marciano-Walcott Bout 12

Modulated Air Blast for Reducing Film Buckle 14
WILLY BORBERG

16-mm Leads at SMPTE Meet 17

In the Spotlight 18

AFL Backs IA on Tax, 16-mm Suit, Film Imports 19

General Precision Laboratory's 46-Ampere Arc Projector 20

The American Labor Movement, III 22

Personal Notes 23

Kilowatt Modulator Among IA-IP Ham Contest Prizes 24

News Notes

Technical Hints

Miscellaneous Items

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MONTHLY CHAT

A TURN for the better seems to have come to our industry, both business-wise and technically.

Business-wise, the customers are coming back. Theatres are earning more money than they did. So, also, are producers. For example: Universal reported this month consolidated net earnings of 1.7 million dollars for the preceding 39 weeks as against 1.1 millions during the same period last year. That's a 35 percent improvement.

The customers did not just drift back, they were brought back. Better product brought them back. The 'Movietime' units—stars and starlets touring the country, going out and talking to the people and making friends with the people, brought customers back.

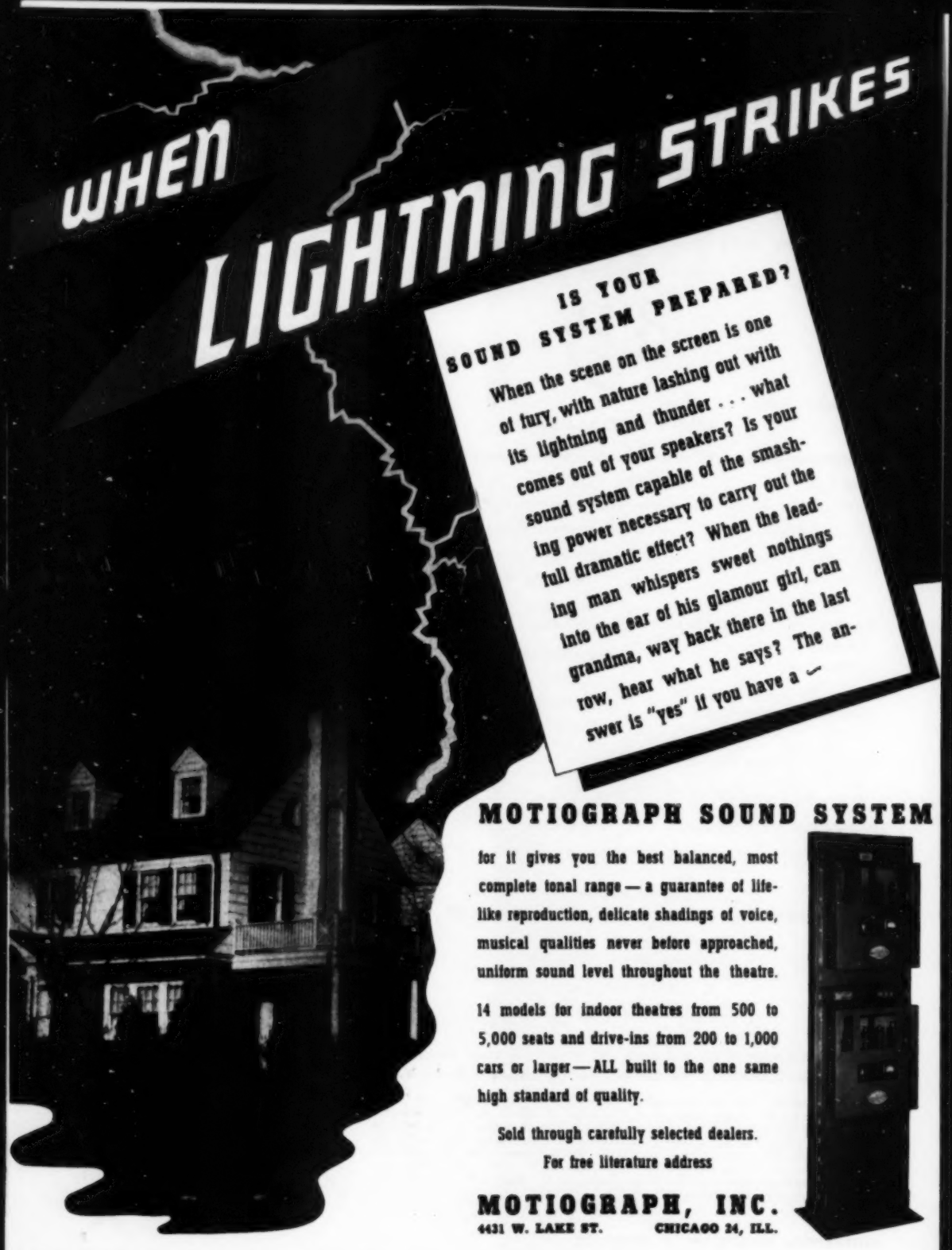
Technically, the past few months have demonstrated a new awareness on the part of industry leaders of the importance of technology to their prosperity—an awareness this corner has been clamoring for for years. Either this voice in the wilderness has at last been heard, or the inevitable logic of the situation has brought the brass around to the position we have said all along they would have to occupy if they intended to survive.

At any rate, the summer of 1952 witnessed the highly impressive demonstration of Eidophor full-color theatre television (IP for July, page 14), with three-dimensional sound (IP for September, page 11); and of Cinerama panoramic cinema with three-dimensional sound (page 10 of this issue). Next month will see the commercial trial, in two California theatres, of polaroid-spectacle three-dimensional screen entertainment.

All this is to the good: business is better and did not get better of itself; the industry rolled up its sleeves and went to work and made it better. Technological improvements are being made, and their importance recognized at last by those whose recognition counts — the men who own the checkbooks. But—

What about the 3 or 4 or 5 thousand American theatres that still at this late date use low intensity projection? What about the 5 or 6 or 7 thousand that still bottle-neck the new entertainment through mechanisms 15 or 20 or 25 years old? What about the exhibitors who look forward to the silly hope that safety film will let them run with one-man projection rooms—and if the one man happens to be rewinding when the screen goes blank, let the screen stay blank, what do they care about their customers! What of these millstones round the neck of the industry?

Why, one of the great blessings of the recent, temporary, television-produced slump is that a lot of them were squeezed out. The type that did not want to meet union conditions for skilled labor, that did not want to replace obsolete equipment, failed to survive. Good riddance! May those of their ilk that still remain with us follow soon.



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Theatre release prints on safety film stock are today an accomplished fact. A six-year span of consistently good performance has gained for this new film base widespread industry acceptance. Six years ago, in presenting the first authoritative series of technical articles on this film base, IP stated that projectionists were faced with a fact not a theory, and it added that the mark of true craftsmanship lies not in the medium employed but rather in the skill with which it is utilized. Safety film theatre release prints are here to stay, come what may, and it is in the best traditions of the projectionist craft that it use this film stock so as to achieve the best possible picture quality on the screen. This is no more or no less than an enlightened and an intelligent self-interest.—Editor

Safety Film: Performance Characteristics

By ROBERT A. MITCHELL

MANY projectionists still hold tenaciously to the contention that safety film, despite several years of satisfactory service, has no place in the motion-picture theatre, and that use of nitrate stock should be resumed for the printing of release positives, no matter which kind of film be used in the camera or for master positives and duplicate negatives. The reasons given in support of this contention boil down to various complaints anent ease of handling and splicing, and picture-quality on the theatre screen. All of these complaints are worthy of serious consideration.

The motion-picture industry has long sought a *safe* film. It is a quirk of fate that movies, until several years ago, have been made possible by running an explosively inflammable ribbon through an intensely hot beam of light. Such a condition as this has made projection a hazardous occupation.

Nitrate Film and Film Fire

Nitrate film is not safe even though it be left untouched in storage vaults. From the moment of its manufacture, nitrate film begins to decompose both chemically and physically. The insidious deterioration continues, hastened by repeated projections and improper storage conditions, until the film is no longer fit to use. Its kindling temperature, initially low, progressively decreases until the film is capable of *spontaneous* combustion during warm, dry weather. Can a blazing reel of nitrate film be extinguished? A carbon-dioxide extinguisher has a 50-50 chance because of the extreme coldness of CO_2 "snow"; but because nitrate film contains plenty of oxygen, in a loosely combined state with nitrogen, it can burn furiously even when submerged in water.

The writer would not lift a finger to attempt extinguishing a film fire. Close the ports, turn on the house lights, break the arc (if you get a chance), and take off. After the film has burned itself out, ventilate the projection room thoroughly before making a survey of the damage or cleaning up the projectors. Thankfully, we need this advice less and less as safety film displaces nitrate film. Safety film won't burn in a projector magazine. In fact, it is difficult to make it burn at all when rolled up on a reel.

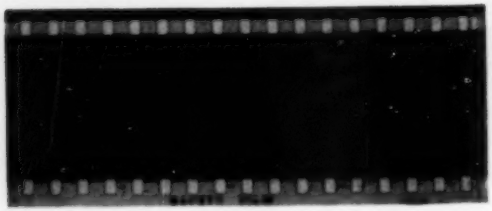
All attempts to produce an acceptable safety film made prior to 1946 have been rejected by the trade because the safety films offered were physically unsatistory for machine processing and for repeated projections *via* arclamps of high power. These early safety films shrank, buckled, and wore out very quickly because of brittleness. Picture-quality on the screen accordingly failed to measure up to the high standards set by nitrate-film performance. Since picture-quality was, and still is, the vital consideration, not one of the early safety films was able, on its own merits, despite the absence of fire-hazard, to displace the dangerous and chemically unstable nitrate theatre-release positive film.

The Old (Diacetate) Safety Stock

Now what about the quality and properties of *modern* safety film, known as "triacetate" film, or, more correctly, as "high-acetyl" film? Is it satisfactory? Does it compare favorably with nitrate film in performance? Exactly what are the objections so many projectionists raise against it?

Considering the unhappy fate of earlier types of safety film, it would seem that we projectionists are judge and jury in the case of nitrate *vs.* high-acetyl safety film.

Picture-quality, we repeat, is still more important to the motion-picture industry than complete reduction of the risks involved in the manufacture and use of its photographic and sound records. Projectionists, acutely fire-conscious, feel the same way toward the matter. The points to be considered, therefore, are



Safety film identification: In addition to the words "Safety Film" there are *horizontal identifying* marks located every fourth sprocket hole within the row of sprocket holes along the non-sound edge of the film.

those raised by projectionists who still prefer nitrate to the latest high-acetyl safety film.

"Safety film becomes brittle and shrinks much more rapidly than nitrate film with repeated projections," volunteered a surprisingly large number of projectionists whom the writer considers as spokesmen for thousands of brother projectionists. These men added, in effect: "When safety film is accidentally pleated or crimped, the resulting creases can seldom be unfolded without breaking the film. Not so with nitrate film, which is sufficiently tough to withstand such misuse."

The writer could have gone all the way with these complaints had only the *earlier* types of safety film been meant. But having projected many reels of all types of film on many makes and models of projection machines, and recalling clearly the extreme brittleness encountered countless times with nitrate film, some of it fairly fresh stock, he began to wonder if projectionists who complained of shrinkage and brittleness had not subconsciously confused the properties of diacetate and acetopropionate safety film—(the earlier types)—with modern high-acetyl safety film. Because, actually, the new safety film shrinks very much less than the *best* nitrate film, and the new safety film does not become brittle in normal use.

The old diacetate (or "low-acetyl") safety film, by the way, was the first type of safety base manufactured by Eastman Kodak. Although acetylated to a slightly higher degree than the "normal" cellulose diacetate (about 34% acetyl) low-acetyl base (38.0% to 39.5% acetyl) is commonly called "diacetate" safety base. It was introduced by Eastman on a large scale in 1923 for 16-mm home-movie films.

Although it was occasionally used for non-professional 35-mm prints, diacetate film was definitely unsuitable for projection by powerful arcs in theatres. It shrank and buckled excessively and became frame-embossed and brittle after only a few runs. Not only that, but it also gave trouble when machine-processed because it swelled rapidly in contact with water, resulting in slack loops, and quickly shrank as it passed over the rollers of the drying cabinets, resulting in tautness and subsequent permanent deformation of the film.

Only the acetates, propionates, and butyrates of cellulose are of practical use as *plastics*—and these and other kinds of relatively non-inflammable plastics have almost completely replaced the cellulose nitrates (cellulose esters of nitric acid) from which the dangerous nitrate motion-picture films and other "celluloid" articles of yesteryear were made.

Cellulose acetate is a cellulose ester of acetic acid alone, and cellulose propionate is a cellulose ester of propionic acid alone; *but cellulose acetopropionate is a mixed cellulose ester of both acetic and propionic acids.*

Acetopropionate safety film was found to be much superior to the older diacetate film. In fact, it was about midway between diacetate and nitrate film in most of its physical properties. Although used successfully during the second world war for service showings, and for all 16 and 8-mm subjects, the few short subjects on acetopropionate base released to the theatres proved that it was unsatisfactory for professional use. It shrank, became brittle, the perforations tore out easily; buckling, focus-drift, and other in-and-out of focus effects were of a large magnitude.

So acetopropionate was out for 35-mm filming. But continued research in the safety-film field resulted in a number of experimental films. Of these Eastman chose the high-acetyl (triacetate) film as being best suited for professional use at the present time, and the most like nitrate in physical properties.

Modern (High-Acetyl) Safety Stock

High-acetyl film was introduced to the trade on an exploratory basis in 1946; and in 1947 it began to be used extensively as a replacement for standard 35-mm release positive stock. The "duplitized" Trucolor prints released by Republic Pictures were noteworthy as the trade tests which "sold" the industry on the new safety base as soon as its performance-characteristics, first determined by extensive laboratory testing, were verified in the field.

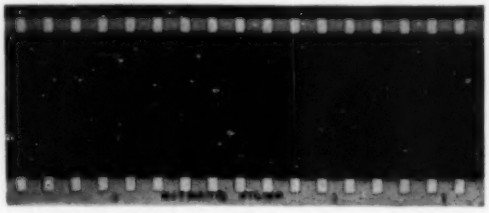
The Trucolor trade tests were especially severe, since Trucolor, like other double-coated color positives, nearly doubles the difficulty of splicing. Not only must the blue emulsion on the normal emulsion side of the film be scraped off one stub, but the red-orange emulsion on the reverse side must be scraped from the other stub in order to obtain two film-base surfaces which face each other in making the splice.

Projectionist resentment against the new film was immediately evident. Some complained they could not focus it clearly, blaming this defect on the film base, when actually the duplitized nature of the photographic images was at fault. If a good focus cannot be obtained with Trucolor, Cinecolor, Supercinecolor, Magnacolor, *etc.*, it is simply because it is impossible to bring *both* sides of the film to a focus on the screen. The best that can be done with 2-color duplitized prints is to bring the blue or cyan image to a focus; with 3-color duplitized prints, the magenta image.

Especially annoying, however, were the black-and-white "sneak" tests, wherein black-and-white films were handed to the projectionist without adequate instructions for splicing them, or even furnishing cements which would "take" on high-acetyl base.

For example, one of the earliest trade tests consisted of features, the first two reels of which were printed on one kind of stock, the next two on the other, *etc.* While tests such as these verified the serviceability of high-acetyl film, they also gave the projectionist a slap in the face which he could hardly be expected to appreciate.

From the raw-stock manufacturer's point of view, "sneak" tests were nevertheless necessary to reveal any defects which might turn up under actual theatre usage. Happily, safety film held up remarkably well in comparison with nitrate stock, and was even superior to the latter in several important respects. But breaks in the show, due to *safety*



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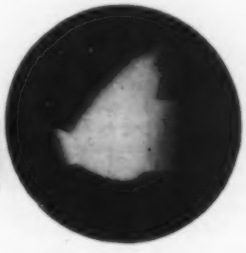

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did not help either the theatres or the projectionists.

High-acetyl base contains from 42.5% to 44.0% acetyl, and is thus not quite so highly acetylated as the "normal" triacetate (44.8% acetyl). And herein lies one of the secrets of the success of the new safety film. Because it is slightly less acetylated than the highest degree of acetylation possible, it is very much more readily attacked by suitable solvent liquids and accordingly is easily cast into the form of film by the manufacturer and is easily spliced by projectionists and exchanges *when properly compounded film cements are used!*

The physical characteristics of high-acetyl safety film are now very well known. They resemble those of nitrate film very closely, except that its tear-strength and rigidity are slightly lower. But safety film doesn't buckle as badly as nitrate film: it retains its original flexibility and shrinks comparatively little. It doesn't become brittle rapidly like nitrate, hence is superior for super-high-intensity projection. And old safety print gives a better picture on the screen than an equally old nitrate print *because safety film retains most of its original qualities.* Safety film, unlike nitrate film, is permanent in storage and doesn't burn any better than wet paper. This is a far different story than could be written about the earlier types of safety film.

Characteristics of High Acetyl Stock

Now to offer a few more words about the alleged shrinkage and brittleness of high-acetyl safety film about which projectionists have been complaining.

Nitrate film of good quality may lose up to about 0.7% of its length through shrinkage. Older types of nitrate film could lose up to nearly 2.0%, and actually tear on the sprockets. The shrinkage of nitrate film is seldom uniform: it varies from foot to foot. The pitch of the sprocket-holes varies accordingly, causing a vertical weaving of the picture and, in moderately severe cases, a tearing sound at the intermittent sprocket. If a vertically-weaving picture is obtained with a safety-film print, it is only because the picture was printed from shrunken *nitrate* negatives. This is frequently the case with reissues of *old pictures printed on fresh safety stock.*

Under average conditions, a high-acetyl safety print seldom shrinks more than 0.15% after about 300 runs; while a nitrate print shrinks about 0.35%—more than twice as much—after the same number of runs. After approximately 300 runs, safety and nitrate films have about the same degree of brittleness. Does this mean that safety film is no better than nitrate film in regard to brittleness? Not at all. If both types of film were given even a fewer number of runs on equipment employing the highest-powered arcs, it would undoubtedly be found that safety would be appreciably less brittle than nitrate.

The second and concluding article on the performance of safety film stock will be published in the next issue of IP. It would be particularly helpful to the craft at large if there could be appended thereto a summary of projectionist opinion based on actual operating experience with this film stock. Such opinion is earnestly solicited.

Nitrate has a slightly higher degree of flexibility when both types of film are fresh, but nitrate loses its flexibility, rapidly becoming brittle with both use and age, *while safety film retains most of its original flexibility.* (In certain cases the writer has observed that comparatively fresh nitrate stock is unduly brittle, fracturing when creased.)

Some Projectionist Complaints

The matter of film-buckling has elicited complaints aimed at safety film. In order to convince the writer that modern safety stock buckled more badly than nitrate stock, several of the projectionists interviewed directed attention to the "waviness" often seen in the turns of film in large rolls of safety film.

One projectionist emphasized this point by removing two reels of film from the film-cabinet, one safety and the other nitrate. The convolutions of the 2,000-foot roll of safety film were wavy, and the outside turn was definitely buckled in appearance. The layers in the 2,000-foot roll of nitrate film were perfectly circular to the eye, and lay flat and smooth on the reel.

Unwinding a few feet from each reel, the writer noticed that the safety film was pliant and tough, and possessed a curliness that looked very much like severe buckling. Gentle stretching of the safety film, however, instantly brought it out reasonably flat with only a slight negative curl (emulsion side convex, base side concave) and without any trace of actual buckle.

The nitrate film, on the other hand, had a stubborn curl that mild tension could not remove without a slight fluting or waviness of the edges of the film—even though the film looked perfect wound tightly on the reel. The curliness in this case was due in some measure to slight buckling, the defect which was suspected in the safety film! Any projectionist can make tests like these for himself.

Also noticeable in the nitrate print was pronounced frame-embossing, due, of course, to the large number of projections it had undergone. The nitrate print was the older of the two films. It is of interest to note, however, that even though frame-embossing is not deleterious to satisfactory projection providing that the embossing is uniform in degree throughout the entire reel of film, *safety film is markedly less subject to embossing than is nitrate film.*

Returning to the subject of the wavy appearance of some rolls of safety film, even when the film is quite new, Mr. W. I. Kisner of Eastman Kodak comments:

> "Of the complaints of this nature on high-acetyl safety film which we have investigated, we have found no case which was so serious as to cause projection difficulties."

This comment is significant to the writer because it lends the strongest support to the conclusions reached by personal experience, namely, that the waviness of the safety film does not affect focus on the screen. Both Mr. Kisner's statement and the writer's experience are further substantiated by an opinion, based upon extensive research, expressed earlier by Dr. F. J. Kolb, Jr., of the Eastman research staff:*

> "It has been shown that film in the aperture is almost never flat, and that its position bears no relationship to the curl of the film-loops or other shapes the film may assume either entering the top of the projector gate or leaving the bottom of the gate.
>
> "Film in the aperture under the influence of the light-beam," added Dr. Kolb, "behaves as though the emulsion surface were expanding with reference to the base dimension, so that each frame is distorted into a pincushion shape with the emulsion surface on the convex side: since the edges are held, the center of the frame is displaced toward the arc. *This is a perfectly normal phenomenon occurring in all cine projection.*"

Dr. Kolb points out additionally, that if the film is threaded up so that the emulsion faces the projection lens, the same expansion of the emulsion-side occurs, in this case with the center of the frame displaced toward the screen. The conditions prevailing in standard projection, with the emulsion-side facing the lamp, are, however, more satisfactory optically, permitting a clearer over-all focus on the screen.

The writer's most recent experience in theatres, operating on different makes and models of projectors under diverse conditions, provided convincing evidence

(*Continued on page 29*)

* "Air Cooling of Motion Picture Film for Higher Screen Illumination" by F. J. Kolb, Jr., IP for January 1950, p. 16, col. 2. A liberty has been taken with the first quotation in order to make clearer Dr. Kolb's meaning.

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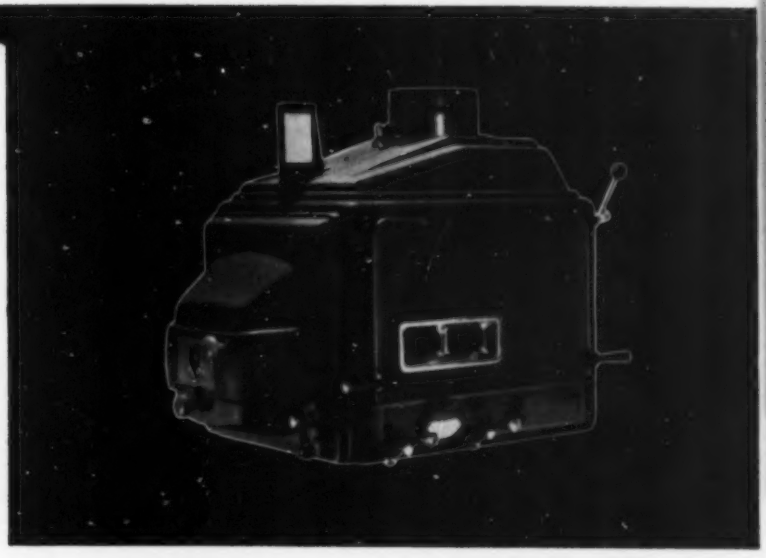

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CINERAMA—A Step in the Right Direction

By AARON NADELL

UNVEILED in New York on September 30th with a glare of publicity and glamor, Cinerama demonstrated beyond shadow of doubt that the public wants something new and different technically, will crowd to it, and pay for it gladly. The matinee of October 1st, the first commercial performance of Cinerama, played to an SRO audience at admissions of $1.20 to $1.50, and was welcomed with salvos of applause.

Cinerama is probably not the boon and savior the industry has been awaiting, but it does seem to prove that salvation can be found in technological advancement; and in addition it will quite likely earn large sums of money for its promoters as a big-city, State Fair and road-show novelty. In those applications it should also provide substantial employment opportunities to the projection craft, since it requires not less than *three* projection rooms! (In the New York showings they are using four, but these are still on a more or less experimental basis.)

The expressed theory behind the new method is that "peripheral vision"—seeing out of the corners of one's eyes—creates illusions both of third dimension and of realism in general. To achieve this effect, a cycloramic screen is used, so that members of the audience, in forward seats at least, have a motion picture substantially on three sides of them, and do see parts of it out of the corners of their eyes, almost as fully as in real life. The immense curvature of the screen —146 degrees, not much less than a half circle—makes necessary triple projection, or presentation of the picture in three panels. These are joined seamlessly (that is the intention, not always maintained) to form one vast, sweeping panorama.

The effect, as viewed for the first time and with suitable program material, is startling. IP reported upon a laboratory presentation in November, 1950, (page 10): "So intense is the feeling of realism transmitted by Cinerama that not a few viewers are overcome physically—the genteel term is 'nausea' or 'seasick'—and are compelled to leave the auditorium hasily."

This extreme result was not repeated at the October 1st matinee, but the audience was decidedly "overcome" with excitement; whistling, whooping and ultimately applauding at the opening sequence in which they seemed to be actually riding in a seaside roller coaster, looking out over the ocean, swaying and turning, climbing, and swooping in spine-tingling descent. The effect produced was not that of seeing a movie, but of being there in the darting, rocking car. The shoulders of some members of the audience could be observed to sway with the motion of a car they were not riding but felt they were. Subsequent scenes did not always reproduce the same intense realism.

Public reaction at that first of all commercial showings was enthusiastic not only in applause, but also in conversations overheard during the intermission. They thought it was "great."

One advantage that helped produce this impression was Technicolor of marvelous quality. Another was three-dimensional sound better than ever heard in any movie theatre. During the *Aida* presentation, for example, one could close one's eyes and almost imagine that the orchestra was actually a living operatic orchestra—almost, that is, nearly but not quite altogether; something indefinable and slight was still missing. But of what other mechanized sound can one say as much? Coming from six different speaker systems, this sound seemed to be always at least quasi-binaural in quality; and at times it followed the action across the screen or swooped round the sides and rear of the auditorium in true stereo reproduction. Much of the uncritical audience's enthusiastic acceptance of Cinerama must be credited to truly splendid color and sound.

But if they liked it so well, what's wrong with it, if anything?

Plenty is wrong with it that uncritical eyes would not notice at first, but will waken to slowly when the novelty wears off. That no doubt is why its sponsors extended their premiere invitations to personalities who would be impressed and give Cinerama favorable publicity, but not so freely to technical people. For example: Maggi McNellis, radio commentator, interrupted her September 30th description of Fall styles in

The Cinerama screen is built up like a venetian blind with vertical slots made of a plastic tape. There are 1100 strips in all. Sound transmission takes place through the slots between them. From the rear, as shown in this picture, the screen is at certain angles fairly translucent, but from audience point of view appears absolutely solid.

ladies' hats to announce her invitation to see Cinerama—but no invitations were sent to the Society of Motion Picture and Television Engineers. (Nor have Cinerama's sponsors ever accepted repeated invitations to present a paper on it before the Society.)

What's Wrong with Cinerama?

There are at least eight major technical flaws in the Cinerama process, none of which admits of ready or easy remedy, and all of which were glaringly visible even at the first commercial performance when equipment was still factory-new, and operation supervised by inventors and engineers in addition to projectionists.

1. Horizontal lines are seldom straight. (They are projected onto a curved screen, which curves them.) The pretzel-like effect on railroad tracks was almost grotesque. Funny, or perhaps unfunny in so serious and earnest a project, was the unhorizontal sea-horizon in the roller coaster sequence; for, while the car was rising toward the top the horizon line was a smiling mouth, corners curving up; but when the car reversed and started downward the horizon also reversed and became disconsolate, corners down. The same inevitable, unavoidable effect was also visible in other sequences, but railroad and horizon lines showed it most clearly. If Columbus had had Cinerama instead of only an egg he would have had no trouble at all proving the earth is round—one look at the horizon in the Aquacade sequence would have been proof plenty.

2. The joins between the three component panels (frames) are not always as perfect as desired; vertical junction areas often show plainly.

3. Projector jump (vertical vibration) of the three projectors is not in synchronism. For example, during the solemn singing of *Abide With Me* one of the massive church columns was partly in one panel and partly in the other; and these two half-columns vibrated against each other, completely destroying the impressiveness of the effect, at least to one observer.

4. When one of the three projectors gets out of frame and needs to be reframed with respect to the others, illusion again is ruined.

5. The projection light on the three panels is often unmatched as to both brightness and color tone. The lagoon of Venice seemed at times to be composed of water of three different colors. And in the Edinburgh sequence the white-faced Scotch bagpiper who marched across the screen from one panel to another instantly became sunburned!

6. Whenever horizontal lines stretch across the screen so far as to pass from one panel into another and the camera is panned, a jiggle appear at the narrow area of junction. This, in combination with the projector jump mentioned above, produces some really grotesque effects. Queerest was in the airplane sequence when Lowell Thomas proclaimed: "Nobody ever saw Manhattan Island like this before." He was quite right: nobody ever saw the Empire State Building doing a jig before. Later on in the same airplane sequence the Sierre Nevada mountains danced.

7. Keystone distortion in viewing: it is obvious that to a person sitting at either side of the theatre there must be keystone distortion of all objects appearing at the same side of the screen, because that side of the screen curves toward him. This was especially visible in a choral number; the chorus divides into two groups which take up their places at opposite ends of the scene. The group appearing at the far side of the screen looked normal to an observer in a side seat; but the group at the near side looked thin as matchsticks.

8. The peripheral vision advantage claimed for Cinerama applies most effectively to those seated up front; and becomes progressively less toward the rear of the theatre. The Broadway Theatre, New York, in which these first commercial showings are held, is an old legitimate house essentially square in shape; in a longer and narrower auditorium only a relatively small percentage of the audience would be exposed to the full effect of Cinerama.

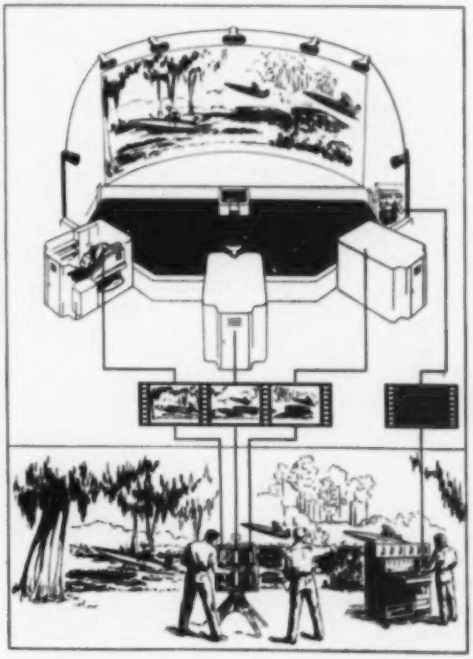
And technically unskilled reviewers, reporting the premiere in the New York daily press, though apparently they did not note all the mechanical flaws, did comment on some; and also noted that the presentation offered only spectacular scenes, no dramatic or emotional ones.

How It Works

How it works, in general, is illustrated here by the artist's sketch. At bottom is shown the process of making the film. The camera, at bottom center, carries three reels of 35-mm film that run simultaneously and in synchronism with each other. Three camera lenses are set to point 48 degrees apart. In consequence, the scene before the camera is photographed in three parts over a visual field extending through 146 horizontal degrees. The vertical field covered is 55 degrees.

At right, in the lower panel, is the sound recording control unit. This is wired to seven microphones and records seven soundtracks on a separate 35-mm film. Six of these tracks are derived from microphones spacially distributed to correspond with the three separate picture films; the seventh track is associated with an "over-all" microphone placed for general coverage of the entire panoramic area—this is the emergency track, to be used only in event

(*Continued on page 24*)



How it works is indicated in this artist's sketch. At bottom, center, triplex camera produces three independent 35-mm films; at bottom, right, 7-microphone control console records 7 soundtracks on 35-mm film (one track for emergencies only). Three picture films are played through three projectors located in three separate projection rooms. Three merged images appear on the curving screen. The six soundtracks produce stereophonic sound through six speaker systems.

Theatre Tv Grosses $400,000 Showing Marciano-Walcott Bout

Estimated 125,000 patrons in 50 theatres from coast to coast witness match by video. Drive-in shows it 36 feet wide at $10 per car and rents radio time to apologize for turning away the thousands that could not be accommodated.

THEATRE television in its most extensive network to date brought the Marciano-Walcott engagement, staged in Philadelphia on September 23rd, to over one hundred thousand spectators at a gross revenue of nearly half a million dollars, and turned away at the lowest estimate tens of thousands more who would have been glad to buy tickets at the advanced rates charged. On the average, according to best available estimates, the theatres showing the program charged and got $3.50 per admission.

Several theatre Tv records were broken. Attendance and grosses were the largest to date. The first drive-in Tv showing in the world was part of the event, and patrons there saw the largest Tv image ever created—36 feet wide; and the longest Tv projection throw—125 feet.

A coast-to-coast theatre video network was created for the first time. New York and Los Angeles, Miami and Seattle, Pittsburgh, Indianapolis, Louisville, Chicago, Minneapolis, and Denver were among the 30 cities where the program was available. Seven theatres presented it in New York, and three in Chicago. One mechanical failure was reported, in New York. The management refunded approximately $13,000.

Outstanding experience, perhaps, was the drive-in Tv showing, the projector for which is pictured on this page. The theatre, owned by Smith Management Company of Boston, is located in Rutherford, N. J., on Route S-3, and named the S-3 Drive-In. It normally accommodates 1,300 cars at ordinary drive-in rates; but on the night of September 23rd charged $10 per car (no limit to the number of passengers) and $2.50 apiece to walk-ins. The latter numbered 1,200. Thus, the gross revenue at the S-3 was $16,000 on that evening. If S-3 could do as well every night it would gross $16,000 x 365 or $5,840,000 per year!

The management of the S-3 Drive-In rented time over radio station WPAT, Paterson, N. J., to apologize to all who wanted to attend but could not be accommodated; and perhaps apologized also to local and State police for the tremendous traffic tie-up, many miles long, created by the thousands who drove out hoping in vain to be admitted.

Image quality at the S-3 was reported excellent; reception was from the Tv antenna atop the Empire State Building, New York City, which is only a few miles distant by air; and reproduction by RCA PT-100A instantaneous theatre equipment.

Of the 50 theatres carrying the event, 37 were RCA-equipped. Paramount film-intermediate apparatus recorded the program on 35-mm film. A number of theatres bought Tv equipment specifically in time for the occasion. Milton Schwaber's new Met Theatre in Baltimore, Md. installed a Motiograph-Trad dual channel system under the guidance of Henry C. Dusman of Baltimore's J. F. Dusman Co. And at the opposite end of the country, B. F. Shearer Co.'s Homer Tegtmeier similarly equipped San Francisco's Telenews Theatre. Victor Trad, president of the Trad Television Corp., personally supervised the Telenews installation.

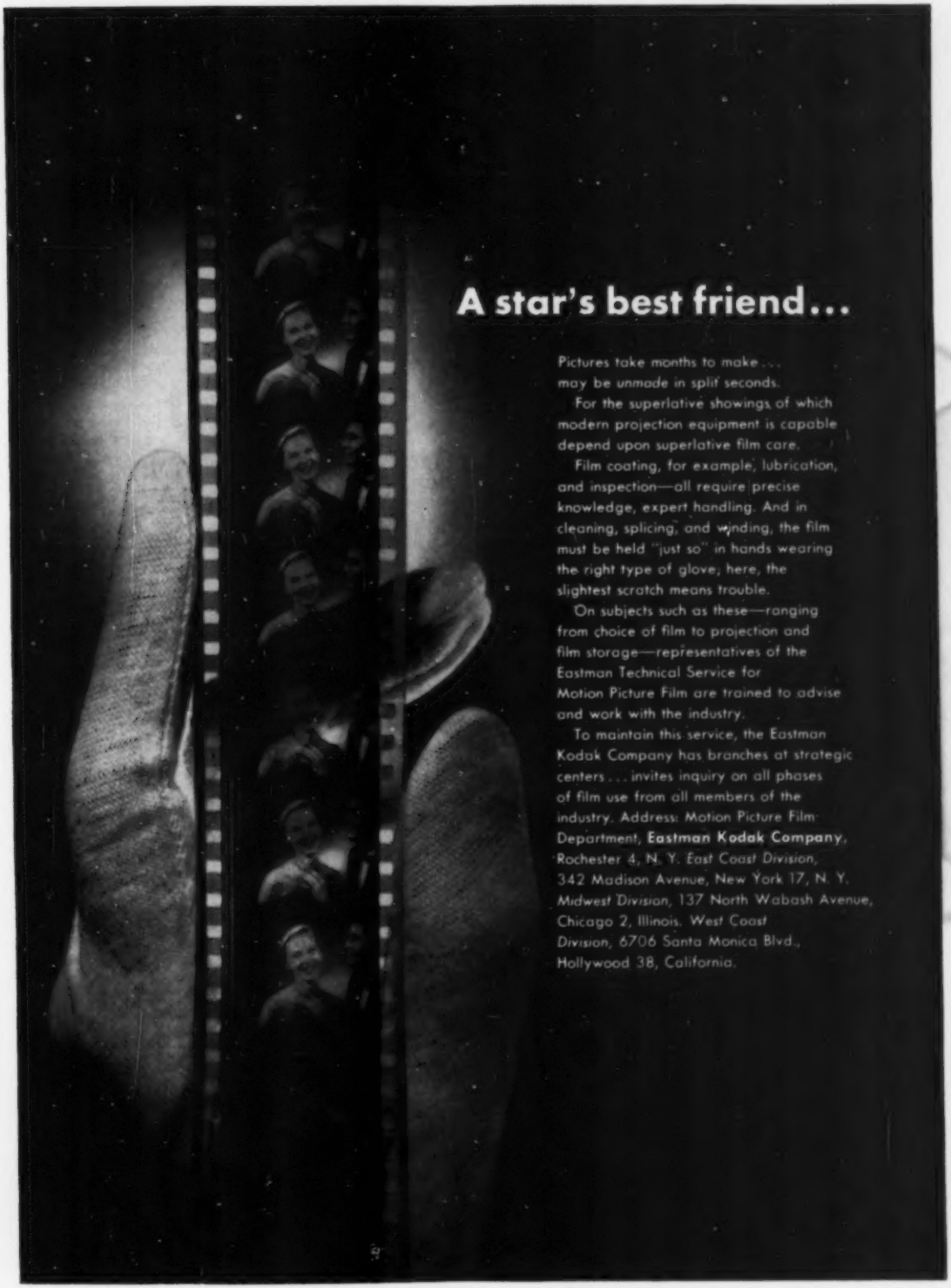
A number of the houses carrying the Marciano-Walcott program offered motion pictures also. In some cases double features were shown, one before the main event and another after it. Other exhibitors, however, offered nothing but the telecast from Philadelphia in return for their average $3.50 admission.

Resentment was reported from Boston and other New England areas because the contest was not made available there on theatre or any other Tv in spite of the fact that it was on view in theatres in communities much closer to Philadelphia—New York specifically, and also Asbury Park, N. J., and others. Over large areas of the South and Southwest the program could not be shown because of limited transmission facilities. And in Philadelphia itself and regions reasonably adjacent, including Atlantic City, no theatre showings were permitted.

Most of the theatres that booked the telecast reported SRO or overflow audiences; at the S-3 Drive-In it is estimated that no less than 5,000 would-be customers were turned away. The true

(*Continued on page 27*)

Mobile "projection room" housing Tv equipment parks 125 feet from screen of New Jersey drive-in to reproduce the match for capacity-plus audience. Regular projection room is identified by projection and viewing ports on structure in the background.



A star's best friend...

Pictures take months to make . . . may be *unmade* in split seconds.

For the superlative showings of which modern projection equipment is capable depend upon superlative film care.

Film coating, for example, lubrication, and inspection—all require precise knowledge, expert handling. And in cleaning, splicing, and winding, the film must be held "just so" in hands wearing the right type of glove; here, the slightest scratch means trouble.

On subjects such as these—ranging from choice of film to projection and film storage—representatives of the Eastman Technical Service for Motion Picture Film are trained to advise and work with the industry.

To maintain this service, the Eastman Kodak Company has branches at strategic centers . . . invites inquiry on all phases of film use from all members of the industry. Address: Motion Picture Film Department, **Eastman Kodak Company**, Rochester 4, N. Y. *East Coast Division*, 342 Madison Avenue, New York 17, N. Y. *Midwest Division*, 137 North Wabash Avenue, Chicago 2, Illinois. *West Coast Division*, 6706 Santa Monica Blvd., Hollywood 38, California.

Modulated Air Blast for Reducing Film Buckle†

By WILLY BORBERG

General Precision Laboratory, Pleasantville, N. Y.

Present-day demands for high-intensity light sources point up the need for a suitable technique for reduction of excessive film buckle. This article shows why modulated air blast is to be preferred over continuous air blast. It presents experimentally obtained data regarding buckle magnitudes in 35-mm film.

THE type of buckle with which we are concerned in the present discussion is a deformation which takes place during the frame cycle while the film is in the aperture. It may leave no record of its existence on the film after projection. It can be made visible by stroboscopic or high-speed photographic techniques, appearing as a rythmic—almost breathing—motion of the film surface in the aperture. It produces deterioration of image focus during part of the rapidly recurring projection cycle.

Each single picture frame goes through a cycle which starts with pulldown into the aperture, proceeds through the first exposure, the flicker blade cutoff and the second exposure, and ends with the pull-down of the next frame. During the two exposure intervals the film arrests some of the radiant energy from the light source and transforms it into heat. This causes the film to buckle (or bulge) in a manner very similar to that observed in the operation of a bimetallic element. The emulsion, being more opaque than the base, absorbs energy, expands and becomes the outer or convex surface of the bulge. The magnitude of the deformation produced varies continuously during the frame cycle and by an amount which is more than sufficient to affect sharpness of image focus.

The emulsion side of 35-mm film is toward the light source; and hence the film tends to move toward the light, away from the lens, while it is in the aperture.

In accordance with the accepted terminology, the deformation is called *negative* when the emulsion side is convex, and conversely, *positive* when the emulsion side is concave. Flat film is considered to have *zero* deformation.

The film upon entering the projector gate is not necessarily flat, but may have a slightly positive curl, the magnitude of which depends to some extent on the age and condition of the film. It appears that there is some shrinkage of both emulsion and base, the emulsion shrinking more than the base, so that the resulting curl is slightly positive. Typical positive displacement at the center of cold 35-mm film as it enters the gate is between zero and 0.010 in.

How Film Buckles

Instantly upon registration of the film frame with the aperture, the shutter uncovers the light for the first exposure of the cycle. Light energy is absorbed in the emulsion and transformed into heat. The expanding emulsion causes the exposed portion of the film frame to move from its initial zero or positive position, shifting it to a negative position, and causing it to take a somewhat spherical shape.

There is a constantly increasing deformation during the first exposure, and a constantly changing distance of the emulsion surface with respect to the lens. Upon interception of the light by the flicker blade, further movement of the film surface toward the light source comes to a halt. With no light on the film, heat absorption by the film cannot take place. Instead, there is a loss of heat which causes the film to recede slightly toward the zero plane.

At the start of the second exposure, the film surface stands somewhat between zero and its former maximum negative position. During the second exposure, the film continues its excursion negatively, first rapidly, then leveling off. At the end of this exposure the film reaches a more negative position than at the end of the first exposure.

How Buckle Impairs Focus

Figure 1 shows the correlation between the movement at the center of the film surface and particular instants in the frame cycle. The same movement occurs at points off the center of the film surface, though to a smaller degree. A significant effect which may be noted is that the center of the film, which is in motion during the entire cycle, travels through and beyond the acceptable focus limits defined by the depth of the focus of the projection lens.

The projectionist, whose eye cannot follow this rapid sequence of events (48 times per second), has to pick a "best average focus" position of the projection lens, somewhere between the maximum positive and maximum negative of the two exposure periods. If he judges the focus at the center of the screen, he picks a "best average focus" position near the maximum negative buckle of the first exposure. The remaining, earlier part of this exposure produces only a poor and undefined image on the screen.

A portion of the second exposure, also, is beyond the limit of good image defini-

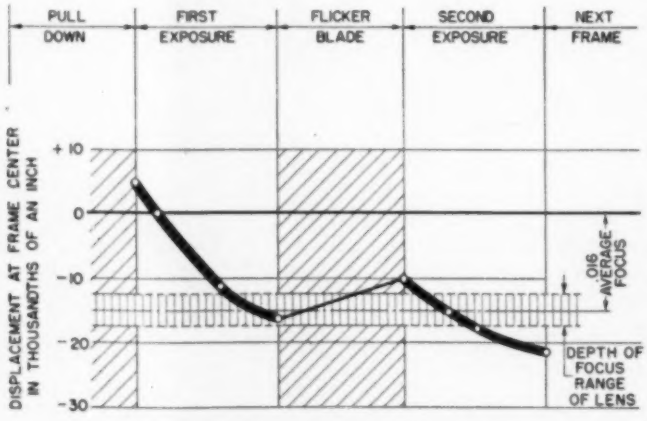


FIG. 1. Film displacement due to buckling at center of frame—no air.

† Cond. from Jour. SMPTE, Aug. 1952.

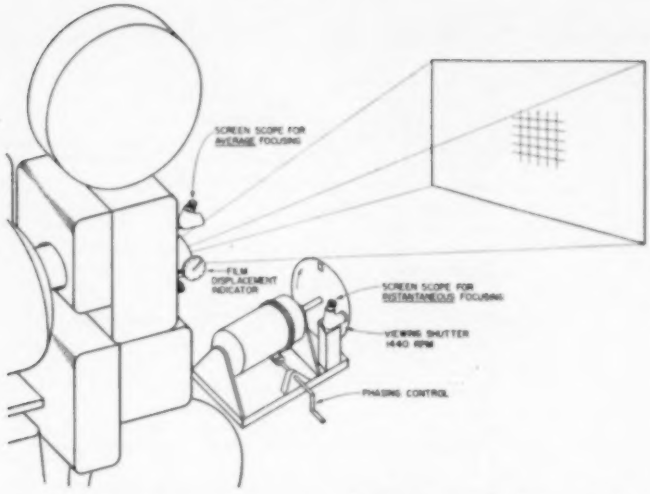


FIG. 2. Test equipment used to determine film buckle magnitudes and time relations.

tion on the screen, and good optical performance can take place only during that part of the exposure in which the film displacement line lies within the depth-of-focus range. The "best average focus" thus obtained gives the best attainable image at the center of the screen.

Actually, in practice, the projectionist may choose a slightly less negative lens position, which is a compromise to gain relatively fair overall definition across the whole screen. Even this compromise results in a fairly large percentage of "out-of-focus" time during a cycle. For the conditions demonstrated in Figure 1, good optical performance is attained during only about 40% of the first exposure and 60% of the second exposure, or a total of only 50% during a complete frame cycle. This is the best the projectionist can do.

The figures so far presented demonstrate the magnitude of the defect with which we are concerned, since they have been obtained with representative equipment, operating under conditions which might be found in any large theatre. For test purposes, the projector was fitted with facilities to determine the various focus positions of the 5-in. focal length f/1.9 projection lens.

Experimental Equipment Used

The light source was a Hi-Candescent Arc Lamp, with F-2 condensers, burning at 160 amp and delivering about 9000 lm to the screen with the shutter running.

All focus settings were made with the aid of Simplex Screen Scopes. The 8-power magnification thus provided enabled lens adjustment with greater precision than could have been attained by direct observation of the screen from the projector.

The film plane position along the optical axis was measured directly in terms of lens displacement, a dial indicator calibrated in thousandths of an inch being affixed to the lens mount for this purpose. Initial calibration for zero position on the dial indicator was made by focusing the lens to produce a critically sharp image of a conical hole in a flat steel plate, the small end of the hole being in the same plane as the emulsion contacting surfaces of the film trap.

The addition of a viewing shutter to the equipment enabled observation of successive phases of the cyclicly varying film frame motion (see Figure 2). The viewing shutter's drive-motor stator was rotable so that the shutter opening of about 9° could be phased with relation to the synchronously running projector.

This stroboscopic arrangement made it possible to view the screen image in small time increments of about 1 msec through all exposure phases of successive frame cycles. The film emulsion position during any specific phase of the exposure periods could thus be established without regard to possible out-of-focus conditions during the remaining, unobserved, portions of the cycle. Dial indicator readings were then recorded in relation to the phase settings. A contactor on the projector shutter timed a short-duration light flash for establishing correct phase reference.

The equipment as described permitted studies of film behavior under actual operating conditions.

Continuous Air Blast Action

The technique of continuous air-blast cooling of film, by which opposing air forces of the front and rear jets are adjusted so as to produce a force for positioning the film, was found to be at best a partial solution to the problem. It is possible to move the film by this method and to shift the average focus position; the resultant force, however, acts upon the film continuously, and therefore, cannot correct for the intermittent cyclical deformations which occur during the two exposure periods.

The center of each frame travels over a range of about 0.020 or 0.030 in. This range is not greatly reduced by application of a continuous displacing air force

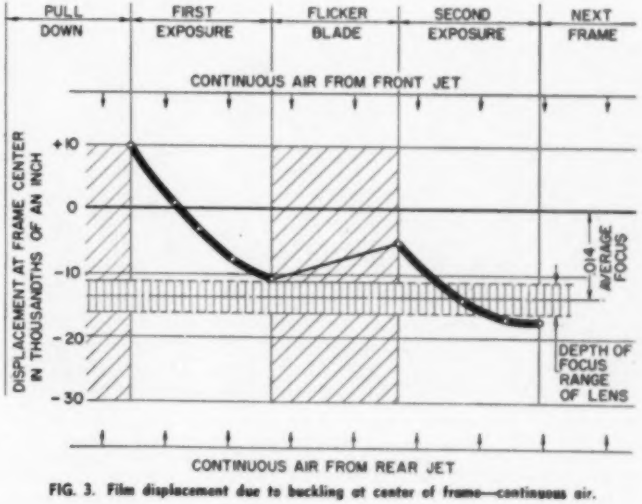


FIG. 3. Film displacement due to buckling at center of frame—continuous air.

(Figure 3). The continuous jets produce a shift in average focus position; this, by itself, only slightly alters the ratio of "in focus" and "out-of-focus" intervals. The air serves primarily as a cooling agent, preventing possible damage to the film in the form of embossing or blistering or the formation of permanent buckle.

It was felt that, because of the cyclical nature of the film frame deformations involved, any corrective action to neutralize the defects should be similarly cyclical. Hence, the following approach (Figure 4) was tried:

(a) The air from the front jet was modulated by means of a rotary valve driven from the shutter shaft.

(b) The air from the rear jet was not modulated and the steady stream of air from this jet was used to force the film toward the lens, thus partly neutralizing the internal forces, which tend to make the film take a deep negative buckle under the influence of light.

(c) The correcting air pulses from the joint jet were timed so that the resultant forces from both front and rear jets opposed the cyclicly varying buckle forces. The motion of each film frame on the optical axis could thus be controlled.

Intermittent Air Blast Action

Figure 5 illustrates the timing of the jets and shows that the position of the film frame can be held steady within fairly close limits. It should be noted that the excursions of the film frame surface can be confined to the depth-of-focus range of the lens. Good optical performance is thus attained over virtually the entire frame cycle.

Figure 5 also shows that a negative displacement of approximately 0.012 in. is allowed to exist at the center of the frame. The question may be asked, "Why is the process not carried beyond this point so as to bring the displacement to zero?" There are two reasons for not doing so. The first is concerned with the performance of the projection lens. In most projection lenses the focal plane of field is not truly a plane, but rather a curved surface. For best performance in this respect, the film is allowed to approximate this surface. The second reason is that flat film seems to be somewhat flaccid under the influence of air flow, as compared to film which is bowed to even a slight degree.

Since the film can be kept within the depth-of-focus limit of the projection lens during nearly the entire time of the two exposure periods, there is marked improvement in screen image definition.

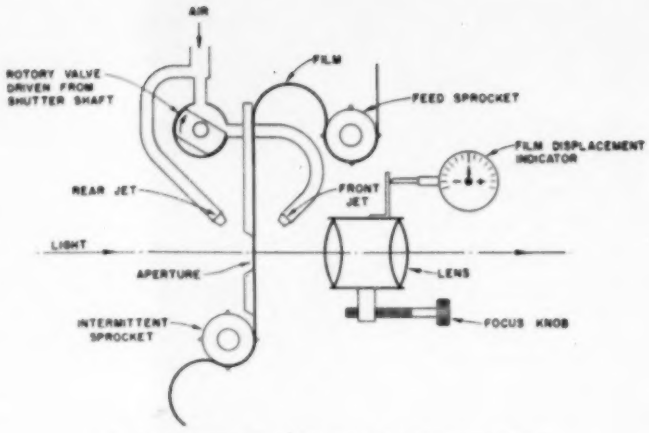


FIG. 4. Arrangement of air jets and film displacement indicator.

Experiments so far have been directed toward the use of the modulated front jet. It is quite possible to use the opposite arrangement of a steady front jet and pulsed rear jet. For better cooling, however, it seems advisable to let the continuous air stream wash the emulsion side of the film, relying on the front jet as the position correcting agent. A pulsed combination of both jets may offer some advantages in air economy, but has not been tried.

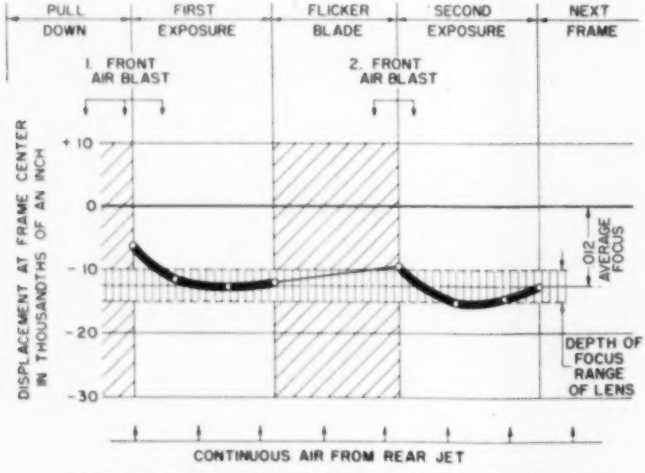


FIG. 5. Film displacement due to buckling at center of frame—pulsed air.

TESMA-TEDA-ALLIED-TOA

In 1953 Theatre Owners of America will join the Theatre Equipment and Supply Manufacturers Association in a joint trade show and simultaneous conventions, Roy Boomer, TESMA secretary announces. Allied Theatre Owners and Theatre Equipment Dealers Association, which are linked with TESMA in the current year's conventions and trade show, will continue to participate, in a quadruple gathering and exhibition in 1953.

This year, however, TOA, which has just had its own get-together and equipment exhibit in Washington, D. C., will not participate in the TESMA-TEDA-ALLIED affair at Chicago next month. The three organizations will stage their festivities at Chicago's Morrison Hotel, November 15-19. Luncheons, cocktail parties, dinners, and banquets are part of the program, providing a festive background to more serious business. Special plans have been made for the entertainment of ladies attending. More than 100 booths will display almost every item of theatre equipment made in the U. S.

Next year's four-ply meeting, it has been decided, will also be held in Chicago, but at the Hilton (formerly Stevens) Hotel, and on the dates October 31 to November 4; two weeks earlier than this year.

16-mm Leads at SMPTE Meet

FOR probably the first time in the 36-year history of the Society of Motion Picture and Television Engineers 16-mm projection received more consideration at a semi-annual convention than 35-mm.

This was at the Society's 72nd semi-annual convention held at Washington, D. C., October 6-10. A wide range of subjects relating to many different phases of motion picture and television technology was canvassed in the course of 94 technical papers and reports. The largest number of papers dealt with ultra-high speed motion pictures used in analyzing motion, mechanical operations and even chemical changes. But 16-mm ran second to this absorbing topic, surpassing in number of papers presented, not only 35-mm but also photography and television. Three of the 16-mm papers, which may be of value to projectionists interested in servicing 16-mm projection equipment, are reviewed in some detail below.

Officers and Awards

The Society elected new officers, to serve for two-year terms, and conferred usual and extraordinary awards, honorable mentions and fellowships upon a number of its members.

Herbert Barnett, assistant to the president of General Precision Laboratory, was chosen president of the SMPTE, succeeding Peter Mole.

Dr. John G. Frayne, Westrex Corporation, is now executive vice president; Dr. Norwood L. Simmons, Eastman Kodak Company, editorial vice president; John W. Servies, National Theatre Supply, convention vice president; Edward S. Seeley, Altec Service Corporation, secretary.

Governors now are—for Eastern states: Gordon A. Chambers, Eastman Kodak Company; and Charles L. Townsend, National Broadcasting Company. Central states: Frank E. Carlson, General Electric Company, and Malcolm G. Townsley, Bell and Howell Company. Western states: William A. Mueller, Warner Brothers; and LeRoy M. Dearing, Technicolor Motion Picture Corporation.

Henry J. Hood, Eastman Kodak Company, has accepted the office of engineering vice president in place of F. T. Bowditch, National Carbon Company, recently resigned.

Society awards were conferred upon Dr. Herbert T. Kalmus, of Technicolor, Inc., John I. Crabtree of Eastman Kodak Company, and Axel G. Jensen of Bell Telephone Laboratories, Inc., who were allotted the Samuel L. Warner Memorial Award, the Progress Medal, and the David Sarnoff Gold Medal Award, respectively.

William C. Kunzmann, retiring as convention vice president after 36 years of service to the Society, was honored with a gold life membership card and a testimonial luncheon.

Fellowships were conferred upon John Arnold, M-G-M; E. E. Blake, Chairman of the Council of Kinematograph Manufacturers Association of Great Britain; O. L. Dupy, M-G-M; Karl Freund, Warner Brothers; Edgar Gretener of Zurich, Switzerland; W. T. Hanson, Jr., Eastman Kodak Company; C. E. Heppberger, National Carbon Company; Henry Hood, Eastman Kodak Company; A. G. Jensen, Bell Telephone Laboratories; Klaus Landsberg, of Hollywood; E. H. Reichard, Consolidated Film Industries; A. C. Robertson, Eastman Kodak Company; Ben Schlanger, theatre architect, New York; John G. Stott, Du-Art Film Laboratories, and E. W. Templin, Westrex Corporation.

Approximately 200 ladies attending the convention were received at a White House tea by Mrs. Truman on October 8th.

It was disclosed that the Society now numbers nearly 4,000 members, in 50 different countries. Members and guests registered at the Convention in unprecedented number, almost 900, in fact.

Papers and Reports

Of the 94 papers and reports presented those of especial interest to projectionists will be condensed in these pages during the months to come.

Three papers, however, will be summarized in some detail in this place. Two of these review the servicing and maintenance policies of 16-mm equipment manufacturers, Ampro Corporation and Bell & Howell Company. The third describes the SMPTE 16-mm test films.

Henry H. Wilson, Ampro Corporation service manager, pointed out that his company's arrangements for maintaining 16-mm equipment include both factory

(*Continued on page* 26)

New president Herbert Barnett (right) greeted by his predecessor, Peter Mole.

"Bill" Kunzmann (left) receiving leather-bound testimonial from Nathan D. Golden at luncheon tendered to Kunzmann in recognition of his 36 years service as vice president of the Society.

Peter Mole (left), retiring president, presents David Sarnoff Gold Medal to Axel Jensen of Bell Labs; Samuel L. Warner Memorial award to Wadsworth Pohl on behalf of Dr. Herbert Kalmus of Technicolor, absent through illness; Progress Medal to John I. Crabtree of Eastman Kodak, and Journal Award to D. L. MacAdam, also of Eastman. Recipients are pictured from left to right in order here named.

IN THE
SPOTLIGHT

WE STILL receive from time to time complaints from projectionists in various parts of the country about the poor condition of prints as delivered by the film exchanges. Although their complaints vary as to the nature of the film damage, the most consistent "beef" is "careless handling and incomplete inspection in the exchanges." The projectionist, of course, finds himself put on the spot, so to speak, when a break in the film occurs and the show is interrupted. One of our readers suggests that if the exchanges would merely inspect and repair the prints and deliver them *unrewound* to the theatres, the projectionists, in the process of rewinding the film, could double-check on breaks, patches, *etc.* This would not only minimize the possibility of a break in the show, but would also prolong the life of the film.

Film mutilation has long been a bone of contention—with projectionists and exchanges passing the buck to one another. IP has published many articles during the past years on the proper handling of prints* and we believe that they are of sufficient importance today to warrant running them again in a future issue. Any comments?

• In line with IA policy, new units are constantly being added to its newly formed Radio and Television department. The latest one to come to our attention is now being organized in Omaha, Nebr.

• William Green was unanimously re-elected president of the American Federation of Labor at the 71st annual convention, held recently in New York City.

• John DeLorenzo, member of Milwaukee Local 164, was a delegate to the National Coast Guard convention held in Toledo, Ohio.

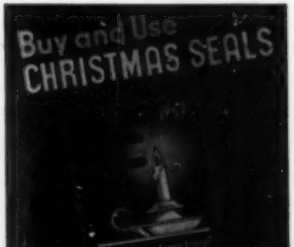
• "Pension Plans Under Collective Bargaining" is the title of a new 105-page booklet recently released by the AFL. This pamphlet covers many problems confronting unions in setting up pension plans, and describes the pros and cons of various alternative approaches. Such questions as "Pension Cost Factors," "Benefit Provisions," and "Methods of Financing," are among the many discussed. The pamphlets are 25c each and may be obtained from the American Federation of Labor, Washington, D. C.

• The attempt of Bennie Berger, well known Mid-West theatre exhibitor, to break down the projection room manpower prevailing in Minneapolis, Minn., has not shaken the determination of Local 219 officials to maintain existing conditions. Theatreman Berger recently purchased the building which houses the Aster Theatre and offered to take over the balance of the four-year lease of the theatre, now held by the Minnesota Amusement Co., provided Local 219 would agree to a reduction in projection room personnel. Needless to say, the Aster Theatre remains dark.

• Local 400, Alexandria, La., will celebrate its 40th anniversary in 1953. Plans are now under way to make this celebration an outstanding one. Stewart Wilson, secretary, and Prentis E. Flowers, both charter members of the Local, have been appointed to the arrangements committee.

• A gold life membership card in Local 222, Shreveport, La., was awarded last month to George E. Findley. Findley is a charter member of the Local, having been one of its original organizers back in 1911.

• A precedent was established by the city licensing bureau of Boston, Mass. when it banned the showing of 16-mm films in the Alpini restaurant. The bureau ruled that the restaurant's food, liquor, and entertainment license does not cover the showing of motion pictures and the management's plan to show 16-mm features to its customers has been abandoned.



• John Callahan, president and charter member of Local 195, Manchester, N. H., was a delegate to the State Federation of Labor convention recently held in Keene, N. H. His son, Bradley, business representative for Local 685, Concord, N. H., is a vice president of the State Federation.

• E. Clyde Adler, president of the Michigan Alliance, IATSE, announced that the Alliance had authorized, at a recent special meeting, an assessment on all its members of from 10 to 25 cents per week in an effort to raise a fund of at least $25,000, to be used to help defray legal expenses incurred by various IA Local Unions in disputes with exhibitors. Adler, who is also the business representative for Detroit Local 38, contends that many of the controversies stem from the efforts of the exhibitors to cut down projection room costs.

• Members of Local 723, Norwood, Mass., marked the first meeting of the season by holding a breakfast party at the Norwood Sports Arena.

• Pittsburgh Local 171 lost one of its oldest members in the death last month of Samuel Berkowitz, 70, projectionist for many years at Warner Bros.' Nabe Theatre. He is survived by his wife, five sons, and three daughters.

• Lloyd V. Stoddard, member of Local 180, Everett, Wash., has been elected Washington State Commander of the American Legion. He is now on a leave of absence from the industry to devote full time to Legion duties.

• Local 547, Florence, Sheffield, and Tuscumbia, Ala., entered a float in the Labor Day parade at Sheffield.

• Roy M. Wier, Local 13, Minneapolis, Minn., has been renominated to the U. S. House of Representatives. He scored a 3-to-1 victory in the Democratic-Farm Labor primary in Minnesota's Third District.

• H. Paul Shay, secretary of the Tenth District and a member of Local 289, Elmira, N. Y., has been elected chairman of Chemung County Draft Board No. 64.

• Eighth International Vice-President Hugh J. Sedgwick has been commended in a resolution passed by the Hamilton (Ontario) Planning Board following his

* Projection Room Handling of Prints, by Robert A. Mitchell, March, 1948, p. 3; Causes and Prevention of Damage to 35-mm Theatre Release Prints, October, 1948, p. 5, etc.

recent resignation from that group. Said the resolution: "He is an indefatigable worker, whose accomplishments could only have been attained by sacrifice and denial of leisure time demanded by most people." Sedgwick is also secretary and business representative for Local 303, Hamilton, Ont., Canada.

• *Out-of-Town Visitors to IP Offices:* Robert Conway, Local 297, San Diego, Calif.; M. Ingraham, Local 253, Rochester, N. Y.; Stewart A. Seifert, Local 203, Easton, Penna.

• Leland H. Swain, 65, president of Local 123, East Liverpool, Ohio, died several weeks ago at his home in Calcutta, Ohio.

• Magnus Nielsen, Local 150, Los Angeles, Calif., represented his Local at the Calif. State Theatrical Federation and Calif. State Federation of Labor Conventions, held at Santa Barbara, August 23-29.

• Speaking of pensions, Bert Barber, member of Local 371, Edmonton, Alta., was retired last month by Famous Players Canadian Corporation on a monthly pension of $75. We were advised by Fred Broadbent, secretary of the Local, that the company will not only pay the full cost of the pension but will also continue payments on Barber's life insurance and hospitalization premiums.

25 Years Ago October 1927

• The General Executive Board sat in session at the Alexandria Hotel in Los Angeles. . . . Local 353, Port Jervis, N. Y., and Local 411, Lindsay, Ont., Canada, suspended for non-payment of per capita tax, in compliance with the International Laws. . . . Ashland, Ohio, Local 576 issued a warning against an imposter using the names of Franks and Blake, who has been borrowing money from various IA members on the strength of his fraudulent claims of affiliation with the Local.

• The following letter received from one of our readers is self-explantory. We believe it deserves consideration and we pass it along for what it is worth:

To the Spotlight Editor:

I would appreciate a little space in your "Spotlight" department for the publication of this letter in which I have set down some ideas about a matter that has been in my mind for quite some time.

As you know, there are many men in the Alliance who, like myself, pioneered in our field and the day when we old-timers will want to retire from our profession is not too far distant. Many, in fact, have already retired; and the list is growing steadily. What bothers me particularly is the fact that when a man wishes to retire from the profession, he goes through the usual motions—makes application at his Local for retirement and after the usual procedure he is informed that his name has been placed on the retired list. So far so good—Mr. Oldtimer is now a man without a profession and outside of whatever pension benefits he may be entitled to from his Local, he is to all intents and purposes a forgotten man—that is, as far as his former union affiliation is concerned.

PIONEERS IN THE INDUSTRY

A group picture of old Powers men taken in the early 1920's, in the days before sound pictures become a reality. Back row, left to right: Frank Connock, Joe Robin, Jay C. Kroesen. Front row: Lester Betts and Cecil R. Wood, Sr.

The thought occurred to me that if each man retiring from an IA Local were presented with an IA retirement card issued by the General Office, signed by the International president and bearing the IA official seal, the retired member will have something tangible to show for his many years membership in the Alliance. The card need only state that the bearer held membership in a given Local for a certain number of years, was a member in good standing, and that he retired on a certain date of his own free will.

Also, it occurred to me that the hospitalization benefits so many IA Locals now enjoy might be extended to take care of retired members. It seems to me that these benefits are most needed when a man retires from his life's work and his chief source of income stops.

I would very much like to get the reaction of my fellow members in the Alliance to the aforementioned.

Sincerely,
Morris J. Rotker
Member, New York Local 306
Past president, 25-30 Club

• Bradley Marcotte, 57, vice-president and business representative of Local 425, Kankakee, Ill., for the past 17 years, died October 7. Marcotte joined the Kankakee local back in 1920, transferring to Houston Local 279 in 1926, remaining there until 1933 when he returned to Local 425.

• Harold Cohen, 51, member of New York Local 306 and projectionist for the past 28 years at Warner Bros. studio, died early this month.

New Pictorial Series

Pictorial Films, Inc., 1501 Broadway, New York, will distribute in the U. S. and throughout the world except the United Kingdom, a series of 18 new color cartoons to be made by Toy Town Producers in England; and will distribute throughout the Western hemisphere five additional color cartoons made by British Animated Films. All these prints will be available on 35-mm, 16-mm, and 8-mm stock.

AFL Backs IA on Tax, 16-mm Suit, Film Imports

THE WHOLE strength of the American Federation of Labor has been put behind the IATSE in the latter's opposition to the 20 percent theatre admission tax, the 16-mm anti-trust suit, and the practice of making films abroad for American showings. At their convention in New York City toward the end of September the AFL adopted unanimously resolutions endorsing the IA stand in all of these matters.

The resolution calling for repeal of the 20 percent Federal admission tax was not only unanimously adopted, but also referred to the AFL committee on taxes for action.

The resolution opposing the 16-mm anti-trust suit pointed out that if this action which demands that producers make their films available to telecasters as well as to theatres, were to succeed, not only would many theatres be forced to close, but the surviving theatres would no longer get pictures of existing quality, because the diminished revenue reaching producers could not finance such creations. Thus the livelihoods of a quarter of a million AFL workers in the film industry would be endangered. The resolution directed the AFL executive council to investigate the sources and motivation of this lawsuit, and instructed all AFL publications to give wide publicity to Labor's opposition to it.

The resolution on foreign production of either theatrical or advertising films opposed this practice when undertaken "for the purpose of . . . capitalizing on cheap foreign labor," or of avoiding American taxes or other normal American production costs.

16-mm

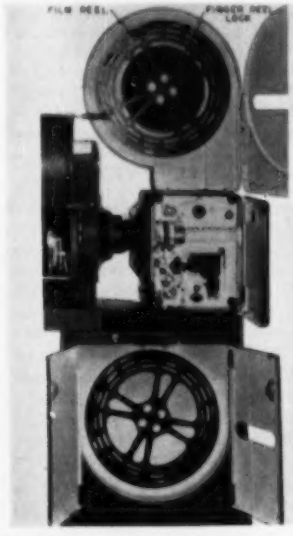
BECAUSE EXPANSION OF 16-mm ACTIVITY PROVIDES INCREASING FIELDS OF EMPLOYMENT FOR SKILLED PROFESSIONAL PROJECTIONISTS IN TV STUDIO AND NON-THEATRICAL SHOWINGS, AS WELL AS ENHANCED POSSIBILITIES OF PERSONAL BUSINESS VENTURES, THIS 16-mm DEPARTMENT OF IP WILL APPEAR MONTHLY.

General Precision Laboratory's 46-Ampere Arc Projector

Model PB 102 has intermittent sprocket instead of shuttle-activated claw, utilizes pulsed air blasts to steady film in gate and improve accuracy of focus, and can be supplied with either of two sound systems as preferred.

GENERAL PRECISION LABORATORY'S Model PB 102 16-mm projector, pictured here, is an arc-illuminated mechanism with intermittent sprocket instead of the more usual intermittent claw, designed throughout for top quality performance and priced accordingly. Picture steadiness, both vertically and horizontally, is rated better than 0.2 percent of the corresponding frame dimension. Test films, it is stated, have run through the mechanism 1,000 times, and test loops 4,000 times, without visible damage to sprocket holes.

The gate is finished to a mirror surface, all sprockets and pad rollers are undercut to eliminate contact with picture or sound areas of film, except only at the sound drum where slippage does not normally occur. Projection lenses are rated f/1.6 and illumination at every point of the screen is said to be not less than 85% of that at the screen center. Sound scanning slit is 0.0005 inch, yielding reproduction rated equal to or better than 8 db down at 7,500 cycles without compensation of any kind. Illumination across the width of the soundtrack is rated even, within not more than 1½ db variation. Projection reels have a capacity of 4,000 feet, or 110 minutes performance.



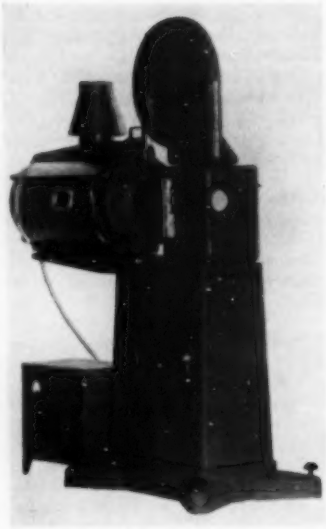
Portion of PB-102 projection assembly shown with doors open disclosing upper and lower reels. The condenser-heat filter is located in the conical lamphouse extrusion between downer and projector.

Two different sound systems are available with this projector, and the model number modified accordingly. As supplied with audio amplifier A20W the equipment is coded Model PB-102; if it is supplied with pre-amplifier AP-6MW it is coded Model PB-102A. The latter arrangement is intended for installation in a theatre or elsewhere where suitable power amplifiers exist and pre-amplification only is needed. Loudspeakers are not part of either model.

Both models incorporate the Strong Electric Corporation 46-ampere arc lamp, Model 19600, and the corresponding Strong rectifier, Model 16196. Power is drawn from a 220-v., 1-3 phase line. Both models also are supplied complete with a tilt-top enclosed pedestal, necessary connecting cables, and air hose.

Special Features

Among outstanding special features is one so new its basic principles are described in IP for the first time in this present issue (see page 14) and were reported in the *Journal* of the SMPTE for the first time only in August of this year. This is the use of pulsed air blasts for reducing film buckle. For details, see page 14; in general, the contrivance



PB-102 projection assembly showing arc lamp and lamp rectifier (left of pedestal). Lower magazine is inside pedestal. Amplifier is a separate unit, not included in this assembly.

is one designed to counteract the tendency of all film to buckle temporarily while in the gate. Cause of this buckle is the fact that emulsion absorbs more heat than does the film base; a differential expansion thus takes place with the emulsion convex; and the film therefore cannot be kept in perfect focus by any adjustment of the lens.

Pulsed air blasts timed to the shutter action reduce this tendency toward buckling sufficiently to keep the film at all times within the depth of field of the lens, making possible improved accuracy of focus on the screen, and by cooling both film and gate protect the film against permanent deformation.

In the PB 102 the synchronized air valve referred to on page 14 of this issue is not used; instead, the shutter of the projector acts as the pulsing valve, admitting or cutting off, according to its position, the stream of air provided by the compressor which is part of the total installation.

The compressor is not part of the projector assembly nor driven by the

projector motor. It is equipped with its own motor. The projector pedestal is equipped with an air pipe. At the time of installation the compressor and its motor are located at any convenient distance from the projector, placement being limited only by the length of air hose and power cable provided. The hose links the compressor to the pedestal air pipe, through which in turn air is conducted to its vent at the projector shutter location.

Air is supplied at a pressure of 30 pounds per square inch and at the rate of $2\frac{3}{4}$ cubic feet of air per minute.

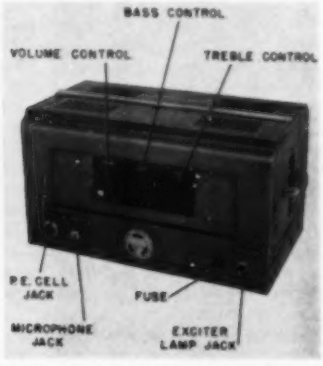
Another special feature is the lamphouse "condenser" so called—although the lamp is a mirror type. The condenser is, as a matter of fact, plano-convex, but its really striking feature is the multi-layer coating on its flat side. These layers in the aggregate constitute an infra-red filter; or more accurately, a visible-spectrum by-pass filter. The glass used is heat-resisting; is not cooled by the pulsed air blast, and does not need cooling.

Optically, the plano-convex filter, being part of the optical system, improves the efficiency from the f/2.3 of the lamp to f/1.6—thus matching a lamp otherwise suited to 35-mm projection with the f/1.6 lenses used in Model PB 102.

Sound Equipment

Presented here pictorially is one of the two sound amplifiers available with this equipment, the Model A-20-W, which has an output of 20 watts. Incorporated in it, as part of its circuitry, is an rf (30 kc) oscillator that provides an inaudible frequency for the filament of the exciter lamp.

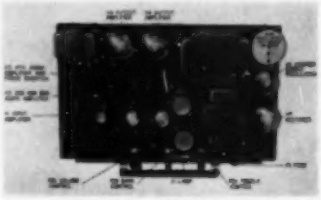
In performance, this amplifier is rated at response flat within plus or minus 1 db from 50 to 10,000 cps (with tone controls set in mid positions). Output is rated 20 watts at 1,000 cps with harmonic distortion of less than 0.7 percent at 15 watts, and intermodulation distortion less than 3.0 percent at 15 watts. Signal to noise ratio with volume controls at optimum positions is given as 69 db. Output (speaker circuit) impedance, 8 to 16 ohms.



Exterior view of A-20-W model amplifier, with separate bass and treble volume controls and overall volume control; provision for microphone as well as PEC input, and exciter rf supply (30,000 cps). Rated output, 20 watts, meets requirements for an audience of 1,000.

Loudspeakers are not part of the system when the same is bought as a unit.

When the PB-102 equipment is to be used in a theatre already fitted with power amplifiers and speakers, the Model A-20-W 20-watt amplifier is not needed, but a pre-amplifier is still desirable. The PEC output would in many cases deteriorate in quality, and pick up noise and interference if transmitted to the installed amplifiers without intermediate pre-amplification. In addition to a pre-amplifier, a source of rf for the exciter lamp is required to take the place of



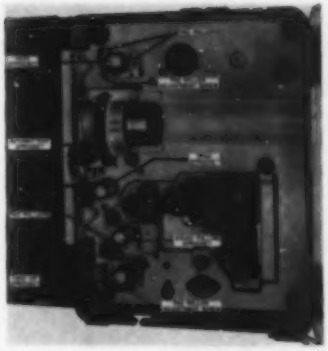
View of A-20-W amplifier with top cover removed. Output tubes are 6L6-GT's. Circular case at extreme top right houses rf transformer for exciter supply; just left of it is power transformer; below power transformer filter choke; filter condensers left of filter choke; output transformer at upper left.

the oscillator tube that supplies this rf when the A-20-W is used; and the 16-mm soundtrack output must be equalized for the characteristics of a 35-mm amplifier system.

For such applications pre-amplifier AP-6MW is provided; plus choice of either of two rf exciter supplies, RF-30K or RF-30K-LI. When these items are used instead of the A-20-W power amplifier the nomenclature of the system is modified and it is designated Model PB-102A, instead of PB-102.

AP-6MW pre-amplifier is rated at an output level of 6 milliwatts into a 500 ohms line. Other output impedances may be used, however, the transformer secondary being tapped for 50, 125/150, 200/250, 333 and 500/600 ohms. Noise level is rated 60 db below 6 milliwatts. Volume control, and also separate bass and treble volume controls, are provided.

Exciter supplies RF-30K and RF-30K-LI are identical except in that the latter provides an additional 6.3 volt, 60-cycle output for the threading lamp in the projector, while the former does not. Both use a 5V4G rectifier tube powering



Operating side of the PB-102 combination projector-soundhead showing film path, projection lens and optical sound reproducer.

a 6L6 oscillator which in turn generates the 30kc output.

Arc Lamp and Rectifier

The projection light is supplied by a Strong Electric Corporation mirror lamp, Strong No. 19600, utilizing a 7-mm positive and 6-mm negative, operating at 33 volts, 43 to 48 amperes, DC. As a safety measure, AC supply to the rectifier is interlocked at the lamphouse door, and open-circuited when the lamphouse is opened.

The rectifier (also by Strong) is a 220-volt input, tube type unit. Its panel mounts an 8-point rotary switch through which carbon current may be readjusted as the lamp warms up in operation; and a voltmeter which may be consulted in association with the ammeter on the lamp. A jumper arrangement on the terminal strip inside the rectifier has been provided to permit compensation for line voltage variation.

BIS Announces Three New Films

British Information Service announces three new films now available in 16-mm sound versions.

Renting at $2.50 a day and selling at $57.50, "The Twenty-Ninth Blitz" is the detailed story of the heaviest air raid on London in World War II, when over 100,000 missiles were dropped, and 1,100 fires started, in the space of four hours. The film is in two reels, black-and-white, with a running time of 18 minutes.

"Antarctic Whalehunt" follows a whaling expedition throughout an entire season, stressing at the same time the need for limitations on whaling to avoid further depletion of whale stocks, and the need for more humane methods. Rental price is $2.50 per day, sale price $55.00. The film is in two reels, black-and-white, with a running time of 19 minutes.

Running 11 minutes in black-and-white and renting at $1.50 per day (sale price $32.00) is "Love of Books," showing the mechanics of making and binding books in a spirit of fine craftsmanship. Stills from this reel are available.

The American Labor Movement

Chapter III.

Between Two World Wars

DURING the year following World War I, a combination of events occurred which led to an increase in the number and severity of industrial disputes. Following a brief downswing in business immediately after the war, there was a quick revival, accompanied by rising prices. By mid-1919, labor was faced with the mounting cost of living. Real wages lagged. At the same time, withdrawal of the Government's limited protection of labor's right to organize and the termination of wartime governmental labor agencies removed restraints which had kept industrial relations running more or less smoothly during the war years. As a result, numerous employers refused to recognize labor unions which had been organized in their plants. So, to protect their recently won gains, many labor leaders called for more aggressive action.

In September 1919, a strike was called in the steel industry by the AF of L Iron and Steel Organizing Committee, which was composed of the presidents of the 24 international unions that had jurisdiction in the industry. The strike was called off in January 1920, after most of the strikers had drifted back to work, with the unions failing in their attempts to gain recognition in the industry.

A strike by the United Mine Workers in the coal-mining industry began on October 31, 1919, but was called off on November 10 after the court granted the Government a permanent injunction against it. In some localities the strike continued into December 1919, when the union agreed to the Fuel Administrator's proposal for an immediate 14-percent wage increase and to President Wilson's offer to appoint a tripartite coal commission to pass on further demands.

Depressions Harm Labor

The economic recession in 1921 and 1922 resulted in many serious work stoppages, such as the railroad shopmen's strike in the summer of 1922. These protests, however, failed to check a general wage reduction movement which also marked the beginning of a decline in union strength. Many unions continued to lose ground despite the rise in business activity, which occurred in the late 1920's. Professors Millis and Montgomery in their book *Organized Labor* advise that the 1920's were years which should "according to historical precedents, have witnessed labor militancy, aggressiveness in conquering unorganized areas and in entrenching more strongly job control already obtained." Instead, this period "found old and established unions experiencing difficulty in maintaining past gains and something akin to inertia, pacifism or disillusionment pervading the movement as a whole."

The successes of antiunion employers in many industries (metal, automobile, railroad, etc.) gave this period its popular title—the "open shop era." To weaken or disrupt labor organizations employers in these years introduced a variety of welfare measures, ranging from athletic fields to pension plans, as well as such repressive measures as the use of spies and strikebreakers. Company unions dominated by employers were likewise established. "Yellow dog" contracts, requiring a worker to promise, as a condition of employment, that he would not join a labor union, were also used effectively.

The varied effects of this period on the union movement are described by Lewis Lorwin:

> A considerable part of the membership was able to obtain higher wage rates, increased earnings, and shorter hours. The 40-hour week in unionized plants was widely accepted, while about half a million union members obtained the five-day week. This was notable in the building trades, in some branches of the transportation industry, in the printing trades, in Government employment, and in some of the professions, such as teaching and acting. But where unions were unable to meet the new conditions they suffered a decline in membership, a loss of income, and a weakening of their benefit systems; and they could enforce their standards over smaller areas.

From 1920 to 1923 total union membership fell from about 5 million to slightly over 3½ million. It still remained at this lower level (approximately 3,625,000) in 1929, at the height of the country's "prosperity." Of the 105 AF of L international and national unions active in 1929, only 44 had held their own or expanded their membership after 1925. Most of these were in the building and printing trades, transportation, Government service, and amusements.

The economic depression and widespread unemployment which followed the 1929 stock market crash further reduced union membership to 3¼ million by 1932. This decline was particularly pronounced in industries where machinery was displacing skilled hand labor and in the "sick" industries of mining and textiles, as well as in other industries which had been artificially stimulated by the war. Many unions were hard pressed to survive and maintain some semblance of effectiveness.

Labor Gets New Deal

It was not until after the enactment, in the spring of 1933, of the National Industrial Recovery Act, including section 7 (a) which guaranteed the right of employees to organize into unions of their own choosing and to bargain collectively with employers, that trade-unionism in the United States began to revive. This revival brought a tremendous influx of new members from the mass-production industries into the ranks of unions. Another contributing factor was the enactment, in 1932, of the Norris-La Guardia Act, which limited the use of court injunctions in labor disputes.

Workers in the automobile, rubber, cement, and aluminum industries were rapidly organized on an industrial basis. These new unions were chartered directly by the AF of L as Federal labor unions, since no corresponding international unions existed to absorb them.

Many of the national and international unions which were affiliated with the AF of L also registered substantial gains in membership between 1933 and 1935. The International Ladies' Garment Workers' Union increased its membership from 40,000 to over 150,000. The roster of the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America rose from 94,000 to 130,000. Membership in the International Association of Machinists expanded from 75,000 to 90,000. Other unions reported smaller but nonetheless significant increases.

Further growth was slowed down temporarily by court invalidation of the National Industrial Recovery Act in May 1935 and by the rapid growth of employee representation plans established primarily for the purpose of checking the spread of unionism.

[TO BE CONTINUED]

Theatre Tv Hearings On

Hearings on allocation of television channels for exclusive use of theatre programs, and on rules and regulations to govern theatre Tv service, will be opened by the Federal Communications Commission at Washington on October 20th. The hearings were requested by producer and exhibitor groups, the Motion Picture Association of America, and the National Exhibitor Theatre Television Committee. Engineering and accounting phases of theatre Tv will be canvassed at these hearings. A second group of hearings has been announced by FCC to begin January 12th, when testimony will be received on comparative costs, advantages and disadvantages of telephone as against radio transmission.

PERSONAL NOTES

EARLE G. HINES has resigned as chairman of the board of General Precision Equipment Corporation but continues his association with GPEC under a consulting arrangement. HERMANN G. PLACE, GPEC's president and chief executive, was elected to serve as board chairman in addition to his other duties.

Also elected to the board were WLADIMIR A. REICHEL, who furthermore has been

Earle G. Hines

Hermann G. Place

F. D. Herbert, Jr.

Wladimir A. Reichel

named vice president of GPEC, and FREDERICK D. HERBERT, JR. They are the principal executives of Kearfott Company, Inc., GPEC's most recently acquired subsidiary.

GPEC is parent corporation of International Projector Corp. (Simplex), makers of theatre projectors and sound systems, of General Precision Laboratory, Inc., manufacturers of large-screen theatre Tv equipment, and of other very well known corporations in the field of motion picture projection apparatus.

HARRISON ECHOLS, formerly general manager of the Ansco Division of General Aniline and Film Corporation, and more recently with the Consumer Durable Goods Division of National Production Authority, has been named assistant to NATHAN D. GOLDEN, director of the Motion Picture and Photographic Products Division of NPA. Echols replaces JAMES FRANK, JR., who resigned to return to private industry.

DR. DAVID L. MACADAM, Eastman Kodak research scientist, has been selected as winner of the 1952 Journal award of the SMPTE for his paper: "Quality of Color Reproduction" which appeared in the Journal in May, 1951. Dr. MacAdam is one of the world's authorities on color photography.

more B.A.*

*(BOXOFFICE APPEAL)

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CINERAMA—A STEP IN THE RIGHT DIRECTION

(*Continued from page* 11)

the stereo sound created by the other six fails through equipment trouble in the theatre. In that case it provides merely conventional sound coverage to keep the show alive.

In the illustration, three lines run vertically upward from the camera to each of the three 35-mm films the camera produces; and one vertical line runs upward from the recording console to the 35-mm film carrying the seven soundtracks. The drawing is obsolete, however, in one respect, because these tracks were sketched to suggest optical recordings. Cinerama today uses magnetic instead of optical tracks.

From the soundtrack film a line is shown running upward to a theatre control console; and from this in turn another line runs to a row of loudspeakers. Here again the artist's sketch is suggestive only, not accurate in minor details. Thus, there is a loudspeaker drawn as if atop the central projection booth and apparently unwired; other arrangements also are not literally as shown here. Actually, there are three sets of speakers back-screen—at left, at right, and center. Each of these is excited (*via* amplifiers, of course) by one of the seven soundtracks. There is one cabinet-mounted speaker on each side wall of the theatre and one on the rear wall. Each of these in turn is excited by its own soundtrack only. This accounts for six tracks; the seventh, as said, is in reserve.

The picture films shown in the sketch also are not presented nor intended as literally accurate. An exact reproduction of Cinerama film can be found in IP for November, 1950, page 10. The frames are 6 sprocket holes high, rather than four high as usual, and in consequence are substantially rectangular in aspect. Three such frames, projected side by side, produce a merged screen image three times as wide as it is high. The screen is 26 feet high; its width around the curvature would therefore be 78 feet; the chord stretching across the curve from tip to tip is stated to be 51 feet.

The theatre is equipped with three projection rooms. These are the booth-like structures shown in the sketch. In the Broadway theatre three actual booths were built on the orchestra floor, toward the rear of the house, seats being sacrificed accordingly. The three picture films created by the camera are allocated, one to each projection room, threaded into three projectors, and run in synchronism with each other. There is only one projector in each projection room; the magazines are oversize, providing approximately one hour's continuous entertainment. This is followed by a 15-minute intermission; making a total show time of roughly two hours and fifteen minutes.

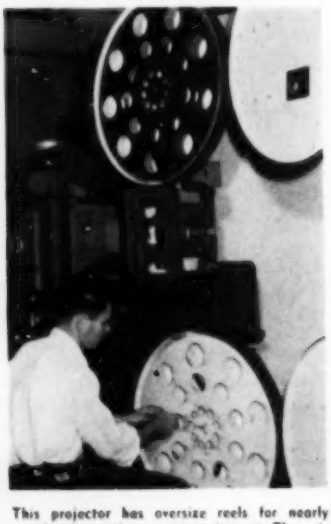
It will be noted in the sketch that the three projection booths are so oriented that the one at the right projects to the left side of the screen and vice versa; the one in the center projects straight ahead. This arrangement naturally minimizes *projection* keystone that would otherwise result from curvature of the screen but does not affect the *viewing* keystone that afflicts patrons seated at either side of the center line.

In the sketch, the engineer's control "pit" is shown at the front of the orchestra. From it, films are framed and kept in frame and otherwise matched and properly merged, by remote control. At right, just above the right projection booth, is the manned theatre sound control console already noted.

The Projectors

One of the projectors is shown in the accompanying illustration. The exceptional size of the reels and magazines is sufficiently evident. Among details that cannot be shown photographically is the fact that the film operates at normal speed of 90 feet per minute, but, since the frames are each 6 instead of 4 sprocket holes high, it is obvious that the projection rate cannot be the normal 24 frames per second. Instead, they project 16 frames per second. Despite this reduced rate no flicker was conspicuously evident in the performance. (However,

(*Continued on page* 28)



This projector has oversize reels for nearly one hour's continuous entertainment. There is only one projector in each booth; intermission takes the place of a changeover. Film runs 90 feet per minute; 16 frames (each frame 6 sprocket holes high) per second.

Kilowatt Modulator Among IA-IP Ham Contest Prizes

By AMOS KANAGA, W6BAA
Secretary, Local 409, San Mateo, Calif.

Its big news this month so let's get to it.

The big IA-IP 1952 contest of the IA radio men to see who works the most brothers over the air is really under way with a bang and to top it all the prizes we told you about are starting to roll in. Now we figured that two or three prizes would be it, but (our heartfelt thanks to our friendly jobbers and manufacturers!) we are going to have some pips—and believe me they will be worth shooting for as all of them are first rate and highly sought after gear.

Not all confirmations are in at this early date but to give you a little preview our good friend Leo, W9GHQ, at World Radio Labs. in Council Bluffs, Iowa, has offered the new BandW Model 600 GRID DIPPER. In fact, Leo even hinted that he would probably go along with some nice fat merchandise orders to boot so that you hard-to-please carbon wasters could make your own choice.

Marshal Sanguinet, W5SK, of Marmax Electronics, who I am told is an old time movie man himself, and Max Rothman, W5PJI, who manufactures the famous

Amos Kanaga (W6BAA) Sec., Local 409, San Mateo, Calif.

Rothman modulater outfits, came through with not the little Marmax modulater but the KILOWATT MODEL! (This has arrived already and I'm tempted to open the big box and QRM you guys.)

Pretty nice don't you think? And its just the start. There's a lot more coming and by next month we probably will have the full list of prizes and their donors for your mouth waterin'. So, brothers, you had better get busy and start racking up those QSO's for 1952 and be sure that good old IP's subscription is in order as we don't want to miss out on any of those desirable prizes. Pass the word along too, will you?

Brother, it's vacation time, there's no

doubt about it judging from the mobiles on the air; and some of those mobiles are space-seeking projection men. A few of the boys found their way up to the top of BAA hill and paid us a visit, drank us all out of coffee (yeah)—and, Oh, man, what rigs some of them had. W6PFF Frank Champlin of 150 down LA way has more generater under his blood than motor. Incidentally that was the first time I had ever met Frank personally and we had yakatad for yars and yars. W6LJA RCA sound man Rudy de Castilla, also of 150, was another swell visitor but had been off the air for a spell. I think all Rudy wanted was a pep talk to get on the air again. A couple of VE boys from Local 348 land were by but I was not home and the XYL didn't get the calls—tell me over the air fellows.

No Gold Awards!!

No Gold Awards this month . . . what happened, gang? But W6LYD Don Johnson of 401 and W6JSK O. S. Keay (what's his handle) of Local 219 along with L. L. (Slim) Kilbourne of Canadian Local 622 came through and made the "Worked 10 IA-IP Award" with plenty of extra ones on the list too. All of these boys are very close to the Gold Award, so we better watch out for them.

Quite a few letters from you CW men, especially who are on 40 meters. Particularly one from W6BHV Bill Thompson of nearby Chico Local 501 suggests that maybe the gang could pass on the dope as to what bands they work so as to make it a bit easier to get the awards. Well, this is pretty hard to do as most of the boys usually work the bands that are open at the time, CW or Phone . . . but if any of you CW men care to let me know your bands I will pass the dope along to those interested. Speaking of CW let's not sell out the new 21 MC band, it's really hot. I try to be on it often and it paid off the other day with a VQ4 contact in Naroabi. Not an IA one but still FB.

Calling Frequencies

The official calling frequencies are again listed here, approximate only—3950, 7050, 14,250, 28,700 and temporarily, until we hear from you if OK, 21,050.

Again let me remind you that the 1952 IA-IP contest closes in December and will have three classifications, so a lot of us will have good chances at those FB prizes. Keep your logs rolling to me so they don't all pile up as they did recently, and remember the other IA man's Local number is a MUST . . . his call, local, name and date. No QSL cards necessary. We'll keep score on this end for you if you like and add the ones on as you shoot them to us.

73 Gang CU on the air.

Tv Seen Turning to Film

"Feature films are one of television's best buys today and will probably remain so for a long time," George T. Shupert, vice president of Peerless Television Productions, Inc., told the 48th annual convention of the Advertising Federation of America. The traditional Tv controversy over live presentation vs. film presentation seems to be settling itself more and more in favor of the celluloid, Shupert believes.

One reason is the time difference involved in a national presentation, which is best met by putting the show on film and projecting it in each zone at the most favorable hour for that zone. Another is the cost factor; a recent survey showing that an advertiser can spot a half-hour projected film show over 39 local stations for 19 per cent less than the cost of network presentation over the same stations, using live talent.

Further, as new Tv stations are opened and present local monopolies become a thing of the past, increased competition will put a new premium on lower costs and additionally enhance the advantage of film, Shupert declared.

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Warner's Profits Down

Profits of Warner's and subsidiaries for the nine months ending May 31st are reported substantially lower than for the corresponding period of 1950-51. Net earnings were only 4.958 million dollars as against 5.808 millions for the initial nine months of the previous fiscal year. Moreover, more than 1 million dollars of the current earnings resulted from sale of capital assets, while in the previous period less than ½ million dollars was gained in that way; tax provisions this year was lower, being 5.1 millions against the previous 5.8 millions; and the current contingency appropriation is also smaller than that of the previous year. Had those expenses remained at the previous level the current profit would have been more in the nature of 3.6 millions than 4.9.

Photographic Calculator

A photographic slide rule designed to calculate depth of field, field of view, aperture scales, film speed per second, hyperfocal distance, and filter and other factors has been placed on the market by Florman & Babb of New York. It comes in two models, one for 35-mm film and the other for 16-mm and 8-mm films. Price is $3.95 including complete instruction manual.

Kodak Sales, Profits, Lower

Eastman Kodak Company reports that for the first six months of 1952 sales were about two percent less than for the same period of 1951, and net earnings about 20 percent less. Sales, both years, were in the vicinity of a quarter of a billion dollars for the six-month period, and net profits in the vicinity of 20 million dollars. Employment was at an all-time high with 51,500 employes in the United States. The company currently has 75,000 shareholders.

Canada's Grosses at Record High

Canadian theatres are continuing to break box-office records, according to a report released by Nathan D. Golden of the U. S. Department of Commerce. Receipts have been steadily increasing since 1945, the report says; touched $86,700,000 Canadian in 1950 and are expected to reach a record $100 million Canadian in 1952. However, there has as yet been no Tv in Canada except such as can be intercepted from U. S. stations; local telecasting is being inaugurated this month in Toronto and Montreal.

Total number of theatres in operation in the Dominion during the first half of 1952 is reported as 1,867 indoor houses and 89 drive-ins. [Accordingly, the Canadian theatre receipts are $7.00 per person against $8.50 per person in the U. S.; Canada has one theatre for each 7,000 population as against one for each 7,500 in the U. S.; and one drive-in for each 155,000 as against one for each 40,000 in the U. S.—IP]

Jim Frank Quits NPA

James Frank, Jr., deputy director of the Motion Picture and Photographic Products Division of the National Production Authority, has resigned that post to accept an executive sales position in New Orleans, Nathan D. Golden, director of the Division, announces. Frank has been associated with the motion picture industry for more than 20 years; he has been assistant to the Photophone sales manager of RCA and New York branch manager for National Theatre Supply, and has taken a prominent part in the activities of the Society of Motion Picture and Television Engineers.

16-mm LEADS SMPTE MEET

(*Continued from page* 17)

and field service. Field servicing is undertaken by persons or organizations who may belong in any one of three categories: namely, franchised dealers, service organizations independent of any dealer but operating under contract with one, and completely independent agents.

As to personnel: "Many of the older men have come from the motion picture theatre field and have had many years of experience in operating and maintaining 35-mm equipment," Wilson explained; others come from the radio, television or public address fields, or received some training in equipment maintenance while serving with the armed forces. In some cases engineering students undertake such work on a part-time basis.

Ampro cooperates with service personnel who have accepted specific training in maintenance of the company's equipment, Wilson explained. Factory-sponsored schools are maintained both at the Chicago plant and at a number of other locations; if attendance at these schools is not convenient, training may be obtained by working in the Chicago or New York service departments. Such training is supplemented by manuals, bulletins and other appropriate information, as required.

Bell & Howell's service manager, O. T. Bright, in a paper describing his company's service arrangements, notes that B. & H. requires "service station personnel be factory trained before under-

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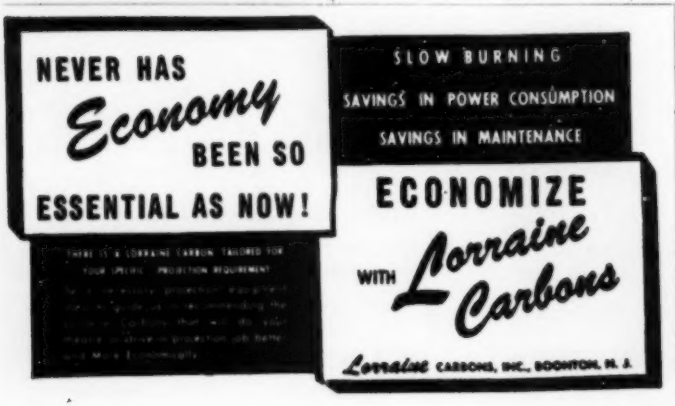
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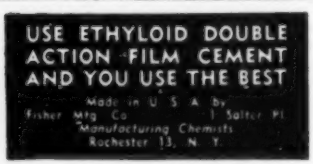
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taking any major repair work" on the company's products. Classes are conducted at Chicago and at branch office service departments; they are limited to five men each to assure highly personalized instruction, and last two weeks.

B. & H. authorized service stations are supplied with complete service manuals containing full instructions for disassembly, reassembly and adjustment, exploded isometric drawings and detailed parts lists. The service station is expected to invest between one and three thousand dollars in equipment, including lathe, drill press, power grinder, buffer, volt-ohmmeter, oscilloscope, signal generator, vacuum tube voltmeter, regulated power supply, condenser tester and dynamic tube tester. Jigs and gauges are supplied by B. & H., but the service station is required to maintain a representative stock of spare parts.

Test Reels

Test reels, developed cooperatively by the SMPTE and Motion Picture Research Council for more accurate servicing of 16-mm equipment, were described in a joint paper presented by Fred Whitney of the SMPTE, and R. A. House of the film recording group of RCA, Camden.

These films are designed to test: projector speed, sound optical assembly adjustment; alignment of sound optical assembly with scanning light beam; uniformity of scanning beam illumination; flutter content; frequency response; system gain (at 400 cycles); travel ghost, picture steadiness, and conformity of picture and sound quality to known standards.

Not all films necessary for these tests are currently available, however; some are still under development. They are being produced by laboratories using equipment of the highest existing accuracy. A more complete description of them, and of the recommended methods of using them in maintaining and repairing 16-mm sound projectors, will appear in IP in an early issue—under SMPTE rules the complete paper cannot be reproduced in these pages for the time being.

THEATRE TV GROSSES $400,000

(Continued from page 12)

drawing power of an event of this kind, shown in theatres, is obviously not fairly represented by a hundred thousand spectators or a gross of one-half million dollars since whole blocks of States could not get it at all. In the States where the program was available only a few cities at most could show it, and in those cities only a few theatres—seven in all of New York City!

Of the four theatres in Pittsburgh, Penna., that are equipped for large-screen television only two, the Harris and the Stanley, put it on. Anticipating these difficulties in the way of complete coverage, Nathan Halpern, president of Theatre Network Television, Inc., agents for the showing, guaranteed a minimum of no more than $120,000 to the International Boxing Club; but he looks forward to very different guarantees in such affairs in the future once large numbers of theatres are equipped to handle them and transmission facilities have become both more available and less expensive.

Meanwhile, in upstate New York, where Fabian's Grand Theatre, Albany, had booked the showing and sold admissions in advance at $3.60 each, counterfeiters forged similar-looking tickets and sold them, both in Albany and nearby communities, at $2 each. Local police, the FBI, and the Bureau of Internal Revenue patrolled the theatre lobby the evening of the 23rd scrutinizing every ticket. The fraud, luckily, had been discovered in time, and warnings to the public had been broadcast. Little harm was done and there was no disturbance in the lobby, but one Albany observer commented: "If we've got to the point where counterfeiters go to work on us, it looks like theatre television has arrived."

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PROTECTING THE THEATRE—FIRST PLACE IN ENTERTAINMENT

CINERAMA

(Continued from page 24)

there were so many other flaws in the picture, as already described, that perhaps flicker, if there were any, went unnoticed.)

Among other devices in the projector not evident in the illustration is one called the "jiggilo"—a vibrating sawtooth inside the head which has the function of blurring the projected image of that edge of each film which must be merged with another on the screen—that is, the center projector needs two "jiggilos" and the side projectors only one each. The sharp division between one film and its neighbor is thus obscured in the merged triple image.

Sometimes, as stated, the merger zones are not perceptible, while at others vertical stripes down the picture represent the blurring areas. Even when merging itself is perfect, however, the discrepancy in brilliance and color tone of the three arcs, and the disparate projector jumps of the three films, still remain to testify that this unity is not one but three.

The Screen

The screen is neither solid nor perforated, but built up of 1100 separate strips of perforated plastic tape. This is necessary because of the semi-circular shape, for if the screen were conventional light would reflect across it from one side to the other. The ribbed construction, resembling in a general way a venetian blind set vertically, prevents one side of the screen illuminating the other with reflected light. Looking out from behind the screen at some angles it is in effect fairly translucent, as the accompanying photograph shows; but viewed from in front as the audience sees it it appears absolutely solid.

The vertical strips are mounted, as the photograph also shows, in front of a rigid metal framework that determines the overall dimensions and curvature.

Entirely independent of its use in Cinerama, or of curving screens in general, this ribbed structure might possibly prove valuable for standard theatre projection. If an ordinary flat screen were similarly built the ribbed arrangement would eliminate need for sound perforations, since sound transmission would, of course, take place through the slots between the ribs. And if ribs were suitably disposed in front of a flat instead of a curving framework, light (traveling in straight lines) would not be lost but reflected to the audience; and the light loss resulting from perforations in existing screens thus corrected.

Sound transmission would be improved at the same time. The transmission area provided by the slots between the ribs in the accompanying illustration is self-evidently far more generous than that afforded by the perforations of a conventional screen. Cinerama people claim a tonal response of from 30 to 15,000 cycles, as contrasted with the 80 to 8,000 cycles, or thereabouts, of ordinary theatre sound. The structure of their screen is doubtless a contributing factor in enabling them to put so wide a range into an auditorium.

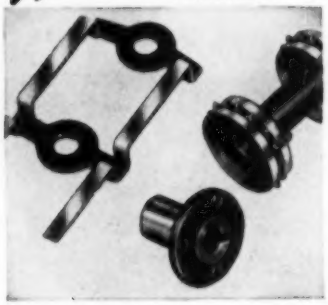
RCA Sound for Water Spectacle

A total of 720 watts of sound, derived from 50 microphones, is supplied to the 8,000 spectators of the musical-marine spectacle "A Night in Venice" by recently-installed RCA equipment. The spectacle, staged by producer Michael Todd, consists of musical extravaganzas and water carnivals, with a cast of over 300. The stadium, overlooking Zack's Bay, Jones Beach (Long Island, N. Y.), is provided by the State of New York through its Long Island Park Commission.

A total of 50 microphones, each with its own individual amplifier and volume control, are wired to a master mixer console. The output of this unit is delivered to twelve 60-watt power amplifiers and thence to the loudspeakers.

An outstanding feature of this high-fidelity system, in the opinion of audio technicians, is that acoustic feedback has been effectively overcome in spite of the high level output, the sensitivity of the "footlight" microphones, and the well-known tendency of a water-surface to reflect loudspeaker sound back into the mikes.

Free PROJECTOR PARTS



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ESSANNAY ELECTRIC MANUFACTURING CO.
1438 North Clark Street Chicago 10, Illinois

SAFETY FILM: PERFORMANCE CHARACTERISTICS

(Continued from page 8)

that no noticeable flutter existed and no changes in focus except for occasional focus-drift compensation were required, for even the most wavy high-acetyl safety prints.

Film Types and Buckling

It is a fact well-known to film technologists that high-acetyl safety film buckles much less readily than nitrate film. If we projectionists declare that the high-acetyl film buckles more readily, the scientists who really know about these things will regard our statement with amazement.

Buckling is caused by the edges of the film shrinking more than does the middle area. This always occurs when nitrate films are projected by means of powerful arcs which unavoidably make the entire gate very hot while projection is in progress. The film base, itself, is heated to a higher temperature by the hot film runners and tension pads than by direct irradiation in the aperture, which heats the emulsion but leaves the base relatively cool. It is very much as though we ironed the edges of the film with a hot iron without touching the middle.

The only way effectively to minimize this permanent deformation of the film is to use "cold" projectors or machines having gates water-cooled in a similar manner. Projectors having only air-cooling of the aperture or heat-filters in the arc beam simply cannot do the job.

The very superior resistance of high-acetyl safety film to buckling is due primarily to its much greater resistance to heat. Tests have been conducted under scientifically-controlled conditions which prove conclusively that high-acetyl film base retains its original propreties under heat conditions that cause nitrate film to lose its tensile strength and become so brittle that it shatters.

Because the low shrinkage characteristics of high-acetyl base are maintained under conditions that cause the edges of nitrate film to shrink much more rapidly than the middle areas, high-acetyl film is very resistant to buckling.

Since using prevue trailers printed on high-acetyl stock, the writer has been spared some of the characteristic troubles associated with reels of film made up by splicing a number of small rolls together. Sound level still frequently varies from roll to roll, but that has nothing to do with the film base. With the exception of a slight change of focus from roll to roll (due, in part, to several changes from black-and-white to color) there has been none of the rapid in-and-out of focus flutter sometimes seen during the first four or five runs of new nitrate ad trailers *which had been tightly wound in small rolls immediately after processing.* Nitrate film takes a curl and holds it tenaciously. Safety film takes a curl, but loses it when held in the gate of the projector.

Film Types and Side-Blurring

One projectionist interviewed claimed that safety film resulted in a picture having a blurred area along the right-hand side of the screen, while nitrate film permitted a sharp focus all over the screen (Simplex E-7 projectors). Although I did not see a nitrate print projected during my brief visit to that theatre, what the projectionist had said about the blurry right-hand side of the picture was true, and it occurred with both projectors when safety film was run.

In cases of this nature the condition of the film-gate runners is usually suspect. Uneven gate tension may also be involved. In mechanisms employing "studio guides" for edge-guiding prints through the gate the flatness of the film-runners cannot be checked without first removing the guide strips, an operation too delicate and time-consuming to be done during a show.

I kept the matter in mind, hoping that I might sometime encounter the same condition in another theatre. That wish materialized in one of the first theatres on my list. There it was, worse than ever, the blurry right-hand side of the picture which was blamed on safety film. But the fact that only one of my projectors

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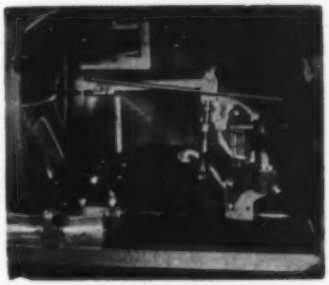
Uses positive carbon stubs *of any length*, without preparation. When entirely consumed, the new carbon goes into use without losing the light, or otherwise effecting lamp operation.



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(Super Simplex) gave a blur on the right side of the screen simplified the problem. No matter how much the film contributed to the defect, the *basic* cause of the trouble lay in the projector, not in the film!

I kept both machines clean and properly lubricated, but I made no attempt to cure the trouble until a few nitrate prints came along. So, having projected both nitrate and safety prints in that theatre, I was able to make comparative tests—not in the sense of scientific analysis with mathematical excursions into resolving power, but merely visually. Any projectionist needs only to look at a picture to be able to tell if something is wrong with it.

These comparative tests revealed that side-blurring on the "bad" projector was definitely worse with fairly new safety film than it was with nitrate prints old enough to be junked. The complaint, therefore, was not entirely wrong. Safety prints aggravated the blurring of the right-hand side of the picture; but when nitrate prints were shown, whether old reissues or "green" newsreels, the defect, while visible, was too small to interfere seriously with the focus.

On the "good" projector, however, both types of film allowed a satisfactorily uniform focus, except that the safety-film prints were easier to focus and keep in focus on this projector than were the nitrate prints. Some of the nitrate prints were badly buckled and shrunken, giving poor results on the screen. There were also in-and-out of focus effects with the nitrate prints which demanded constant vigilance at the focusing knob. Overall, the picture-quality obtained with old nitrate prints was appreciably worse, in general, than that which I have encountered with safety film, old or new. Allowances must be made, of course, for an occasional bad printing or processing job.

Examination of the gate film-runner disclosed two deep hollows on each side, and several smaller hollows on one of the runners of the "bad" projector. Gate tension was also uneven, tending to throw the film to one side, and the pads, themselves, were in poor condition.

The hollows in the film-runners were detected by holding an accurate tool-steel straight-edge against them and shining a flashlight on the main-frame casting behind them.

On standard soundfilm, the pictures are not centered on the film, but are positioned closer to one edge of the film than to the other. The soundtrack has robbed the standard "silent" frame of about 1/10 of an inch of its width.

Now, if the gate be faulty, distorting the film and twisting it a few hundredths of an inch one way or the other, a blurry *right-hand* edge of the projected picture is likely to result. Why the *right-hand edge?* If the same degree of distortion exist on the soundtrack side of the film—and it usually does in these cases—we seldom see it on the left-hand side of the screen picture because the soundtrack area in which most of the distortion occurs is marked off, and hence does not appear on the screen.

If the silent frame and picture-aperture were in use today, we should notice an approximately *equal* amount of blurring on *both* the right- and the left-hand sides of the screen. "Silent" film frames were exactly centered on the film laterally. This explanation leaves no doubt why the right-hand area of the screen image begins to look bad when the film-gate becomes worn and uneven.

Safety film, having a lower "Young's modulus" than even fresh nitrate film, is accordingly more supple and easily twisted, and more readily bent and "pin-cushioned" by the heat of the arc beam than is nitrate film. Although these deformations are transient in safety film—the film springing back into shape again when the stress is removed—it explains why the blurred-edge trouble is usually greater with safety film.

This trouble can be totally prevented by replacing film-runners and tension-pads the moment they show signs of wear, and also keeping the pad tension—no matter how high or how low you like to have it—perfectly even, the same on both sides. The effects of hardened emulsion gumming up the film runners may also be deleterious.

[TO BE CONTINUED]

Tv for Industrial Supervision

Supervision by television over "remote, inaccessible or hazardous operations in areas where human observers cannot be stationed" is provided by a new, low-cost industrial television system just announced by RCA. The equipment utilizes only 22 tubes, one of these being a new 1" x 6" camera tube, and another a 10" viewing tube. The scene to be viewed is transmitted over cable, although for long-distance supervision microwave radio may be substituted. By means of multiple cameras and receivers a single observer can monitor a number of scenes simultaneously. Other auxiliary equipment permits close-ups to be enlarged and projected for convenient viewing by large groups.

Showmanship in 16-mm

Showmanship can be put into 16-mm presentations by opening and closing screen curtains in theatre-style, and such curtain operation can be remote-controlled by suitable equipment just as in theatres, Vallen, Inc., points out. A Vallen "Junior" curtain control weighs less than 100 pounds and occupies less than one cubic foot of space, the company notes. Other equipment by the same maker provides round-the-corner, rear-fold and panoramic curtain operation to solve almost any conceivable problem of stagecraft, in small or large auditoriums.

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M/Sgt. Hubert L. Lee, USA Medal of Honor

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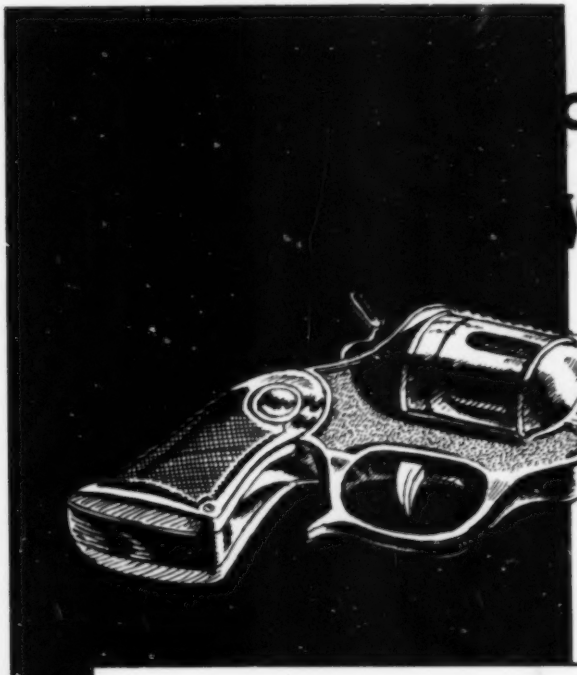

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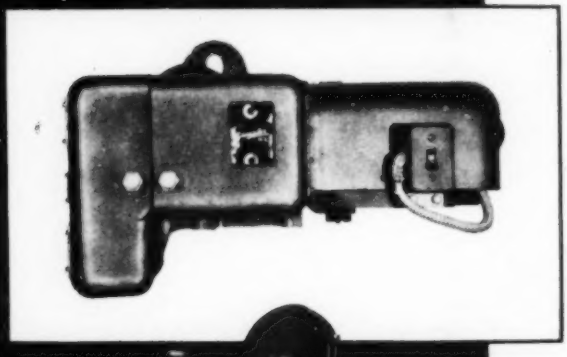

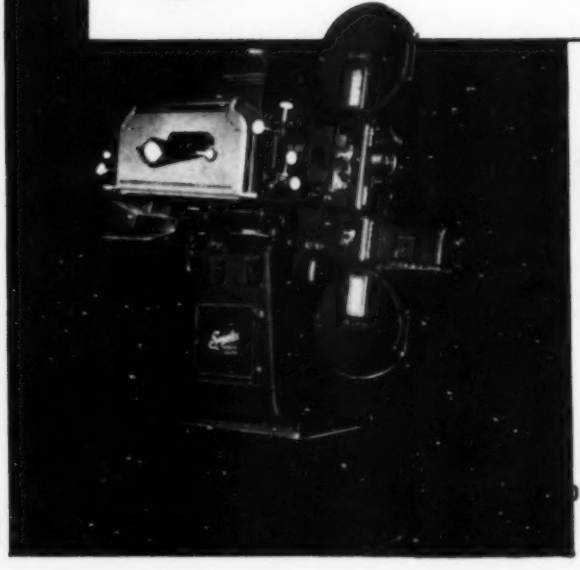

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